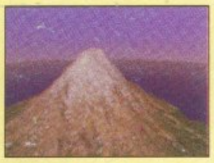
EXPERT ADVICE • TOP TIPS • BEST BUYS • NO GAMES!

ONLY 99P

AMIGA SHOPPER

The top-selling serious Amiga magazine

ISSUE 7 • NOVEMBER 1991 • DISCOVER THE AMIGA'S POWER

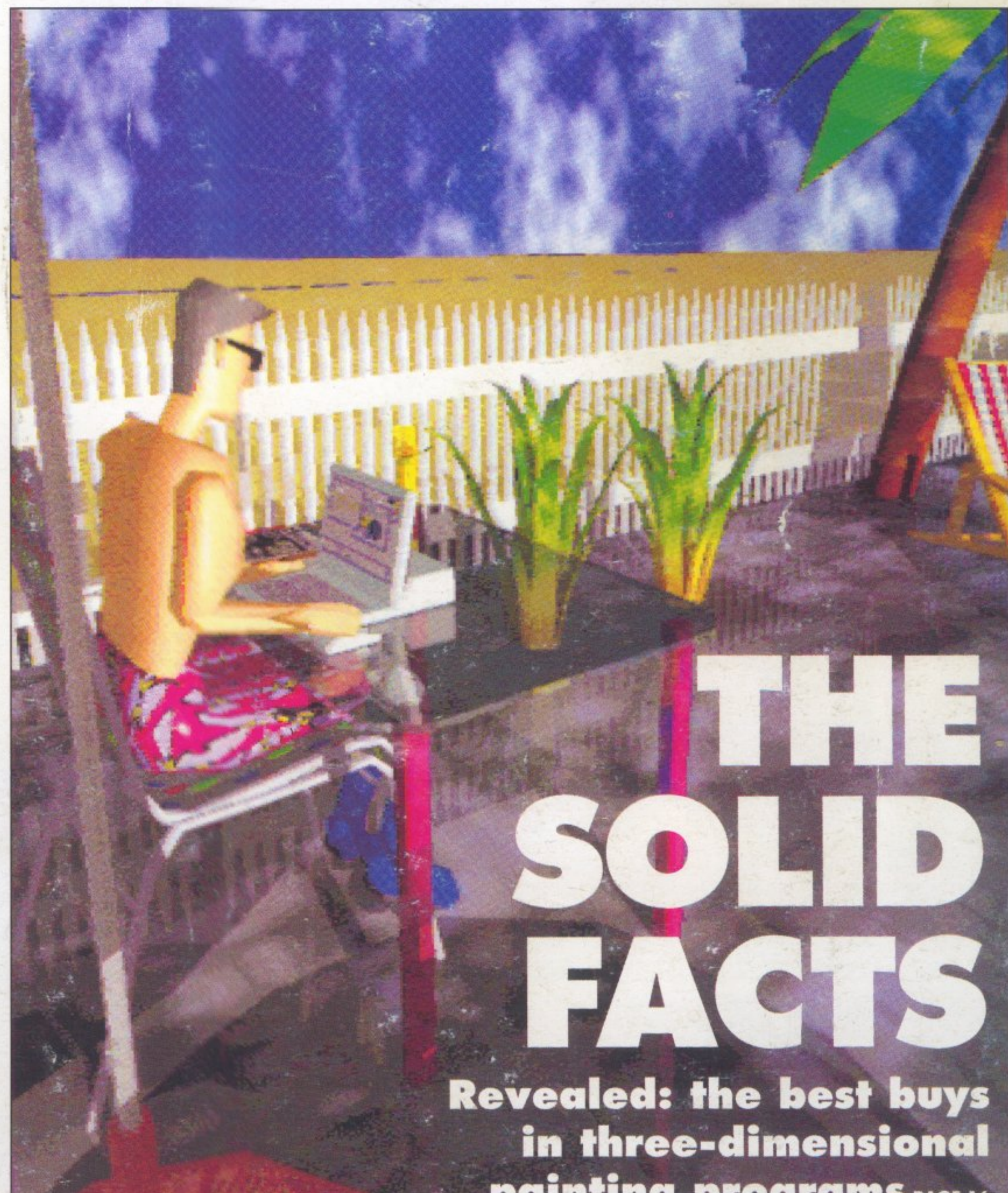


BEGINNERS START HERE

All the jargon explained – guaranteed

AMIGA ANSWERS

The best forum in Britain for solving your real life problems. Sixteen pages of expert advice start on page 49



THE SOLID FACTS

Revealed: the best buys in three-dimensional painting programs PAGE 16

WIN A £1,000 GENLOCK

G2 Systems' VideoCenter Plus must be won – see page 154

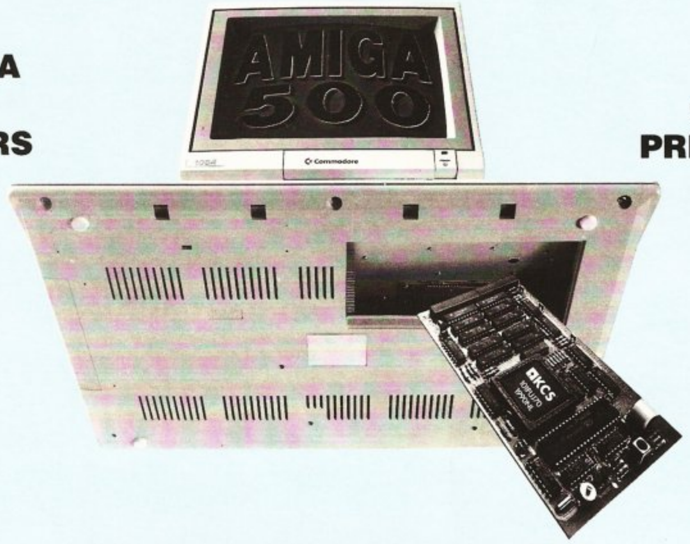
Future Publishing
Your guarantee of value
11
9 770961 730001

KCS POWER PC BOARD

THE HIGHEST RATED PC EMULATOR FOR YOUR AMIGA

PLAY THE LATEST PC GAMES ON YOUR AMIGA BEFORE THE AMIGA VERSION EVEN APPEARS

RUN PROFESSIONAL MS-DOS SOFTWARE ON YOUR AMIGA AT A PRICE YOU CAN AFFORD



NEW LOWER PRICE £219.95 INCL.

FITTED IN SECONDS AND DOESN'T INVALIDATE YOUR GUARANTEE

STOP PRESS...STOP PRESS...STOP PRESS...
ABOUT TO BE RELEASED
VERSION FOR A1500/2000/2500/3000

KCS POWER PC BOARD

READ WHAT THE TOP AMIGA MAGS SAY

Germany's highest circulation magazine - ***Amiga Magazin*** 08.91 using PC-Lab found the KCS Board often faster than many 286 AT's. Their overall test verdict *"sehr gut"* (very good). ***Computer Shopper*** *"All the software I tried ran perfectly"* ***Amiga Shopper*** *"Stability 20/20 - Faultless operation in PC mode from day one - very beginner friendly"* ***Amiga Format*** *"Faster than many 286 AT's"* ***Amiga Shopper*** *"Amazing Screen update"*. ***AUI*** *"The PC Board is indeed a very highly compatible device - an essential Amiga hardware purchase"*
The KCS Board, although in name an XT, is so fast that we leave the last word to ***Amiga Computing*** - *"What's the point in having a whizzo AT processor if it's no faster"* (and the KCS board does not invalidate your guarantee)

WHAT YOU GET

Memory: Amiga - 512Kb RAM + 512Kb RAM disk
PC - 704Kb
(1500/2000/2500/3000) will use our on-board memory as 1Mb memory expansion.
Video Support: MGA, Hercules, CGA 16 colour
Imminent: EGA/VGA and in colour allowing the program constant choice from the full 4096 colour palette. This is a software upgrade available to all.

Disk support: Floppy 3.5", 5.25" up to 3 external hard drives - A590 XT/SCSII/Supra 500XP GVP series and others. Ring for info.
Mouse Support: Amiga mouse as Microsoft mouse
MS-DOS: 4.01 (& manual) Shell (& manual), DOS-Help and GW-Basic, KCS manual and of course our full helpline support.

HOW IT'S DONE

IT'S SIMPLE - no screwdriver, no soldering iron, no technical knowledge required. Just turn your Amiga over, open the cover, slide the board into the connector, close the cover and your Amiga PC is ready.

WHAT OUR CUSTOMERS SAY - Copies of letters available on request

"surpassed my expectations"; "rivals the Compaq 286e I use at work"; even more incredible than I first thought"; "The Amiga hasn't had a look in since I installed the Board"; "May I take this chance to compliment you on the excellent performance obtained"; "much faster and smoother than I expected - great value for money"; "Superb service"; "Your advice and assistance was certainly of a standard that most companies have long forgotten."

BDL
BITCON DEVICES LTD
88 BEWICK ROAD, GATESHEAD, TYNE & WEAR, NE8 1RS, ENGLAND.
Tel: (091) 4901919
Fax: (091) 4901918

Access VISA

Trade enquiries welcome - UK and abroad

Compatibility is excellent, but no-one can guarantee every single program available therefore if your purchase depends on a particular program, please ask us first or send in a copy of the program. (With suitable S.A.E. if to be returned.) Price subject to change without notice.

HELPLINE: 091 490 0202

AMIGA SHOPPER

AT A GLANCE GUIDE

To help you find what you want quickly and easily, this is a cross-referenced list of all the products and subjects covered in this month's *Amiga Shopper*. The subjects covered in Amiga Answers are detailed on page 49; the many PD programs covered on page 140 are listed there. The page numbers given are for the first page of the article in which the product is mentioned.

Cover image by Manfred Kramer

WELCOME

We want to help you get the best out of your Amiga. That's why you will find this issue packed with tutorials and 'how-to' guides which cover the whole spectrum of Amiga computing. If you want to set up a desktop publishing system, then turn to page 121. Beginners in MIDI would do well to read the first part of a major series on Amiga MIDI which starts on page 113. More advanced users will find that our detailed new series on Basic will show the way to build better programs. You can learn how to let more than one person use your Amiga at the same time on page 105, and C and AMOS programmers will already be familar with our sections on those topics. And that's before you even consider our renowned 16-page Amiga Answers section, or the business column on graphing data, or the tutorial on *MessyDOS*.

This is the biggest ever issue of *Amiga Shopper* – 156 pages of advice, reviews and tips. As we grow we hope to expand our pages of expert tutorials even more, so you can look forward to a magazine which really helps you get to grips with your machine.

Graphics on a flat screen can really come to life by adding three-dimensional effects. While a skilled artist can draw 3D images directly, with the help of the Amiga even those of us who are lacking in painting skills can produce pictures with proper perspective and shading, and textured surfaces which look just like the real thing. These effects are created using 3D painting packages, and we put four of them to the test in this issue.

But the Amiga can help your artistic talents even more. With *Vista Pro*, reviewed on page 26, the computer can take real geographical data and draw a landscape based on it from any direction or perspective. For once the tired clichés about exploring the world by computer are true; this is a remarkable program.

As ever, I hope you enjoy this issue of *Amiga Shopper*, and don't forget to write in with your comments and suggestions.

Stuart Anderton

Editor

PUBLIC DOMAIN WORLD

There are thousands of Amiga programs which are available for little more than the price of a disk. And many more which allow you to try the software free before you buy. Each month in Public Domain World we examine the best of these programs and explain how to get hold of them.

This month PD expert Phil South reviews a batch of utilities disks. There a dozens of PD utilities which no Amiga owner can afford to be without. Virus killers, disk utilities, programming aids, file archivers and many others. Find out which disk offers the best selection. Plus graphics, music, demos...

ENTER THE PD WORLD ON PAGE 140

AMIGA ANSWERS

SIXTEEN PAGES DEVOTED EXCLUSIVELY TO ANSWERING YOUR QUESTIONS

Every month in Amiga Answers our panel of experts answer more genuine reader questions than any other Amiga magazine. This month we solve problems on: DATABASES • SCREEN PROGRAMMING • SERIAL CABLES • HUNKS • KEYBOARD MAPS • RAM EXPANSION • RAM DISKS • BOUNCING BALLS(!) • VIDEO TITLING • ACTION REPLAY • MODEMS • SCSI • HARD DISKS • CAD • GARY CHIP • GRAPHICS CONVERSION • and many, many more.

THE ANSWERS START ON PAGE 49
BEGINNERS TURN TO PAGE 71

FOR A FULL LIST OF CONTENTS, TURN THE PAGE

Your guarantee of value

This magazine comes from Future Publishing, a company founded just six years ago, but which now sells more computer magazines than any other publisher in Britain. We offer:

Better advice. Our titles are packed with tips, suggestions and explanatory features, written by the best in the business.

Stronger reviews. We have a cast-iron policy of editorial independence, and our reviews give clear buying recommendations.

Clearer design. You need solid information, and you need it fast. So our designers highlight key elements in the articles by using charts, diagrams, summary boxes, annotated photographs and so on.

Greater relevance. At Future, editors operate under two golden rules:
• Understand your readers' needs.
• Satisfy them.

More reader interaction. We draw strongly on readers' contributions, resulting in the liveliest letters pages and the best reader tips. Buying one of our magazines is like joining a nationwide user group.

Better value for money. More pages, better quality: magazines you can trust.

Future PUBLISHING

The home of Britain's finest computer magazines:
Amiga Shopper • Amiga Format • Amiga Power
New Computer Express • Public Domain
Commodore Format • 8000 Plus • PC Plus
ST Format • Your Sinclair • Sega Power
Amstrad Action • PC Answers • PC Format
and
Mountain Biking UK • Needlecraft • Classic CD

INSIDE THIS ISSUE

AMIGA SHOPPER
Issue 7 November 1991

Editor: Stuart Anderton
Art Editor: Jacquie Spanton
Production Editor: Ian Wrigley
Technical Editor: Cliff Ramshaw
Consultant Editors: Jeff Walker, Mark Smiddy, Phil South
Contributors: Sam Littlewood, Pat Winstanley, Paul Andreas Overaa, Gary Whiteley, Jolyon Ralph, Stewart Russell, Mick Draycott, Michael Lazarou, Dean Cracknell, Paul Ockenden
Ad Manager: Margaret Clarke
Senior Ad Sales Executive: Shaun Lancaster
Ad Production: Deborah Cook
Illustrations: Kev Sutherland, Jolyon Webb
Photography: Ashton James
Production Technicians: Simon Windsor, Chris Stocker, Jerome Clough
Promotions Manager: Michele Harris
Publishers' Assistant: Tamara Ward
Circulation Director: Sue Hartley
Group Publishing Director: Greg Ingham

Printed by Thamesmouth Printing
News Trade Distribution –
UK: Future Publishing 0225 442244
Worldwide: MMC Ltd 0483 211678

Editorial
30 Monmouth Street, Bath BA1 2BW
Tel: 0225 442244
Fax: 0225 446019
E-mail: amshopper @cix.compulink.co.uk

Advertising
Rayner House, 23 Higher Hillgate, Stockport SK1 3ER
Tel: 061-474 7333
Fax: 061-476 3002

Subscriptions
The Old Barn, Somerton TA11 7PY
Tel: 0458 74011

The future of gr

By Cliff Ramshaw

'Revolutionary' is a common superlative in the computer graphics field. In the case of the Black Box combined graphics and accelerator system being developed by DJW Microsystems, its use is justified.

Mark Wills, the company's software engineer, expects it to to "turn the industry upside down and shake it". Dave Westwood, the managing director and designer, thinks that "the future's only just begun".

It certainly has for DJW Microsystems, which has only been in business since November last year. Dave himself previously worked for the Amiga Centre Scotland, producer of the Harlequin graphics board. But, as Dave explained, his board is very different.

"The G2, the Harlequin and the GVP are dumb display devices," he said. "The Black Box can do what they can do and a whole lot more. It's like comparing an abacus to a computer." In fact, when it is released the Black Box will come supplied with software to emulate the other boards on the market.

The idea for the Black Box came from Dave's plans to make both an accelerator board and a 24-bit graphics board for the Amiga. Instead he decided to marry the two on the same board, creating a system with undreamt-of power and speed. Neither he nor Mark could sleep for three days at the excitement of what they had conceived.

"The Black Box will turn the industry upside down and shake it"

The system's main processor is a 68040, which completely takes over from the Amiga's humble 68000. It is clocked at 32MHz, giving a huge increase in speed, but the Black Box's true power lies in the two on-board Texas Instruments graphics chips. As well as maintaining a 24-bit colour (meaning each point on the screen can be any one of 16 million colours), 1,260 x 832 pixel display, they offer the programmer a wealth of instructions for two- and three-dimensional graphics manipulation. Bit-blitting, area fills, line and arc drawing clipping and rotations can all be done with single instructions. The two chips make even the heartiest of Agnuses seem positively undernourished.

GRAPHICS POWER

Imagine a 3D object composed of polygons – a cube, for example. The programmer need only set up a data structure and inform the Graphics Processor Block (as the two graphics chips and their associated memory are called) that the data represents a 3D object. The object will then be displayed, and any changes made will result in an immediate change to the display.

Or imagine a ray-tracing program. Running on the 68040, it will be blindingly fast of course. But if it is written to make specific use of the Texas chips, it will render a 640 x 480 24-bit image in real-time, twenty frames a second. Compare this to an array of 16 transputers, which will produce the same result in four seconds.

The uses for a graphics board with this sort of power are many. Graphic designers, people who work to deadlines and would rather not wait around, have shown the most interest. They envisage its use in the creation of TV games show logos and so forth.

An idea put forward by Dave was to use the system as a route planner. It would be possible to store Ordnance Survey maps as 24-bit files, and, using the internal genlock, overlay the Amiga's screen on top to give details relating to specific routes.

Another use would be in high-quality ray-tracing. Most packages divide the screen into quarters and use three of these to display the different elevations of the scene being designed. With the Black Box, the image could be displayed in real time in the fourth quarter.

An application not mentioned by Dave or Mark is virtual reality. Doubtless a system such as the Black Box would be a great asset in such a graphics-intensive field. A closely related possibility is that of computer games. Mark has been dreaming about writing a mega-game for the system since day one.

PRE-PRODUCTION

At the moment, the Black Box is in a pre-production state. DJW Microsystems hopes to be shipping models by January, and expects to sell 250 in the first six months. The price will be around £3,500.

Other models are also planned, with various memory and processor configurations. The top-of-the-range model will be clocked at 50 as opposed to 32MHz (once the high-speed Motorola chips are available) and will include yet another co-processor. This will perform such wonders as rotation, the displaying of outline text, and interpolated zoom – a technique which avoids the distortion normally created by magnifying or reducing a pixellated image on-screen.

A low-end version of the Black Box is to be released for around £350. Although it

The secret of the Black Box

Running alongside the 68040, and mapped into its address space, is the Graphics Processor Block. This consists of the Texas Instruments 34020 chip, its partner in crime the 34082 co-processor, and a whole lot of 32-bit wide memory.

The Motorola processor has 1Mb of RAM for its own use. The GPB memory consists of 3Mb of high speed VRAM and 1Mb of alpha channel RAM (used for merging an externally genlocked source with the 24-bit image), all of which will hold one 24-bit image at a resolution of 1,260 x 832 pixels. Another 2Mb is supplied as a scratchpad area, holding programs and data for the two Texas Instruments chips.

Because all of this memory is mapped into the 68040's address space, images can be directly loaded into the display buffer. Other graphics boards' frame buffers are not directly available to the host computer. Instead, they must be accessed by a moveable 64K window in the computer's memory map; a method which creates a considerable speed bottle-neck.

Speed is not something a Black Box user will have to worry about too much. It performs blitting operations at 142 million bits per second, line and arc drawing at five million pixels per second, and area fills at up to 1.34 billion bits per second (aided by a degree of intelligence in the Video RAM chips themselves).

Most people will be working in 24-bit mode, but it is possible to reduce the number of colours if they are unnecessary for the application – in DTP or CAD work, for example. In this case a palette chip is used to select the colours to be used from the range of 16 million. Using a smaller number of colours results in a corresponding increase in speed. Up to 16 palettes of 16 colours each may be defined, and palettes may be switched with each scan line of the display to create many more than 16 colours in a single frame. It is also possible in this 16 colour mode to double-buffer the display and switch from one picture to another instantaneously.

The Black Box supports two kinds of genlocking. The internal genlock will enable the mixing of a standard Amiga screen with a 24-bit image. An external genlock can also be added, and in this case video and 24-bit images can be mixed in 256 gradations on a pixel-by-pixel basis.

The two Texas processors run in parallel, so both can be processing instructions at the same time. With the 68040's ability to process two instructions at once, this means that the system as a whole can perform up to four operations simultaneously.

This can be increased still further by the addition of extra 34082 co-processors.

aphics is black...

will not use the Texas Instruments chips, it will be 'intelligent' and largely software compatible with its bigger brothers.

A number of add-ons are also on the drawing board.

GROM modules include a Display PostScript package, a file conversion utility, (enabling foreign format 24-bit files to be read and displayed without intervention from the main

"The Toaster's already out of date: it was designed three years ago."

The first of these to be available will be a range of Graphics ROMs, or GROMs, which will contain programs for the Texas graphics chips. The clever thing about this is that when the system is switched on it will check through its GROM sockets to see which programs are available. Those that are present will be added to the processor's instruction set, so they may be called as if they were single machine code instructions. Calls to non-existent GROM routines will result in an error code being returned. Planned

processor), and a video studio package, giving a range of video effects.

Following later will be a number of RAM expansion boards, a 32-bit SCSI adaptor for the fast transfer of images, an Ethernet adaptor, a multiple co-processor board for the addition of extra 34082s, a real-time 24-bit digitiser, and a four input real-time digitiser/mixer/manipulator. With this, effects such as the wrapping of a video image around a moving three-dimensional object, as over-used on *Top Of The Pops*, will be readily achievable.

A system with this effects unit would be comparable to NewTek's Video Toaster, although more versatile and more expensive. Referring to this, Dave said, "The Toaster's already out of date: it was designed and finished three years ago." No doubt the Black Box will be in a position to receive the same criticism in years to come, but Dave replied boastfully to this with, "If we wanted to design an upgraded version of any one of the boards, we could have it on the market in a fortnight."

Whether DJW Microsystems can substantiate this claim depends on how far the initial version of the Black Box catches on. It is an expensive system, no question, but one which offers professional facilities. It should strengthen further the Amiga's position in the video and graphics markets.

DJW Microsystems is on ☎ 0743 244752.

The Roaring 040s

The latest in Motorola's 680x0 series of microprocessors, the 68040 offers many extra features over its predecessors. The 68000, 68020 and 68030 have found many applications in computers as diverse as the Amiga, ST, Macintosh and NeXT, but the 68040 is a very much more powerful beast. It is far faster for one thing – 70 times more so than the 68000 – and it processes floating point numbers as standard, without the need for a maths co-processor. The internal floating point unit that does this allows a limited form of parallel processing: a floating point operation can be performed simultaneously with an integer one.

It is a true 32-bit processor, at home in a mini-computer, with an address space of 4Gb (a gigabyte being 1,024Mb) and a 32-bit wide data bus, meaning that twice as much data can be sent to or recovered from memory at once when compared to the 68000.

The 68040 also has a crazy little thing called a cache. This is an area of memory actually built in to the chip. There are two areas within the cache, one for instructions and one for data. Sections of code and data are temporarily stored here and operations can be performed much more quickly since external memory accesses are greatly reduced.

As far as memory accesses go, the 68040 has another trick up its sleeve. It has a memory management unit which can take a memory access to any address and re-direct it to any other address. Multi-user systems make use of this kind of facility to support the running of multiple programs without memory clashes. It is also, however, pretty useful for graphics manipulation...

A company in the not-so-grand tradition

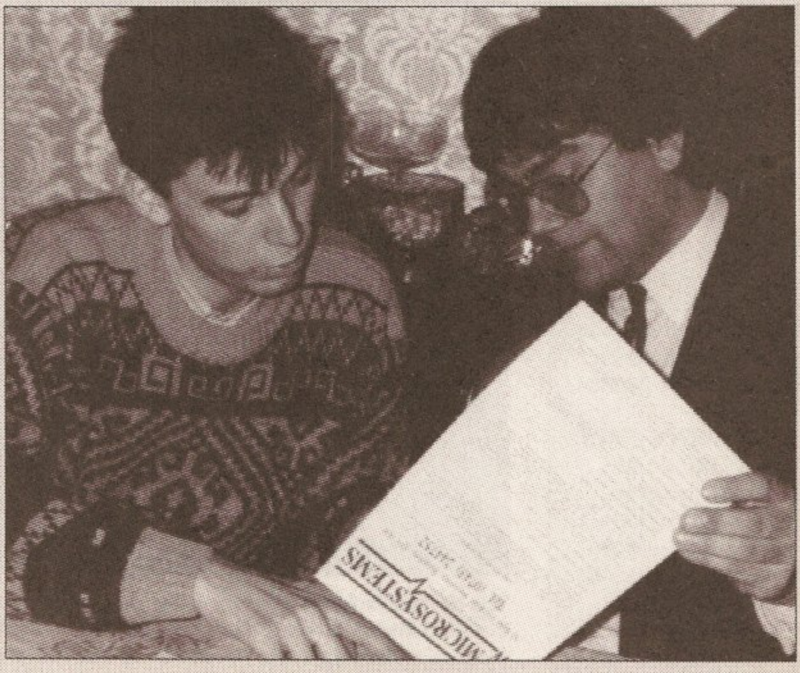
The short history of computing is full of stories of small groups working furtively in garages and bedrooms to create products beyond the conception of the bigger companies. DJW Microsystems continues this slowly dying tradition, albeit from a spacious, tastefully decorated house in Shrewsbury rather than a back room.

The company is essentially a two man team: Dave Westwood is the managing director and designer of the Black Box's hardware, Mark Wills his software sidekick and creative spur. Their relationship is relaxed, fruitful and enthusiastic. To their customers, Mark is known as Mark 'Stonking' Wills because of the unbridled fervour he is apt to use when describing the Black Box.

The small size of the company gives it a high degree of flexibility. Dave and Mark relate a story of an interested customer phoning and asking if the Black Box could support double-buffering to create stereoscopic images. Mark took the caller's number and asked Dave. After half an hour's work with their CAD software, they were able to phone the customer back and say, "It can now."

They have finally had to curb their seemingly never-ending flow of ideas and settle on a final design for the board. There is more to do. At the moment they are busying themselves with the designs for various add-ons. Mark also has a 34020 assembler to write.

The company at present makes its money by selling and repairing computers. A number of smaller-scale Amiga peripherals are also planned to aid in financing the Black Box project, including a 512K RAM expansion and a radio modem. On the subject of finance, Dave quipped, "Let's just say that any time I phone the bank manager, he's out."



Mark Wills (left) and Dave Westwood, the designers of the Black Box.

In Brief

ON THE MOVE
Long-standing PD house George Thompson Services has moved. Its new address is Cucumber Hall Farm, Cucumber Lane, Essendon, Herts AL6 6JB ☎ 0707 664654.

RAM AND CRYSTAL
A new 2Mb RAM card has hit the market from Alfa Data. It will work with both Kickstart 1.2 and 1.3, and costs £140.

Also from Alfa is a trackball called the Crystal because it is transparent and glows red or green depending on the button which is pressed. Quite why you would want it to do that is unclear. Anyway, it retails for £39.

The products are available from Golden Image ☎ 081-365 1102.

LONG GUARANTEE
New mail order dealer Futureworld Computers now offers a two year guarantee with all products sold. Since it is an authorised service centre for many of the products it sells, it is able to extend the manufacturers' guarantees. Futureworld Computers ☎ 0234 218060.

COLOUR LASERS
Budding desktop publishers can get colour laser prints of their work from Studio 101, the printing bureau.

Both IFF pictures and *Pro Page* files may be printed, at a cost of £5 per A4 page (and £2.50 for each duplicate page). Contact Studio 101 on ☎ 0827 280884.

HARD DRIVE CUTS
Silica Systems, UK distributor for Great Valley Products, has announced a reduction in price of the Series II HD8 Amiga 500 hard drive from £599 to £499. Silica Systems can be reached on ☎ 081-309 1111. ☎

World of Commodore show attracts worldwide interest

Americans invade Commodore show

NEXT MONTH'S World of Commodore show is to be well supported by the leading American Amiga companies, who are flying across especially for the event.

Respected firms such as the Supra Corporation and Great Valley Products will have a major presence at the Earls Court show, confirming its pre-eminence as Europe's leading showcase for Amiga products. Both companies will be showing off their range of hard disks and other peripherals.

Also taking a stand will be NewTek, which will be exhibiting its Video Toaster system, reviewed last issue, as well as its range of graphics products. Let's hope that the response will be sufficient to prompt the firm to rush out a PAL version. Other US companies to take stands include Sunrize Industries, New Horizons and Digital Creations.

The Americans will be joined by all the big names in British and European Amiga computing. The show, which is the first consumer show to use the vast Earls Court II complex, is expected to attract tens of thousands of visitors over its three days. Said show organiser (and publisher of *Amiga Shopper*) Greg Ingham: "This show looks set to be a hit. We've been amazed by the enthusiasm of the companies who have booked stalls, many of whom are cooking up bargain offers."

Admittedly we at *Amiga Shopper* could be said to be biased, but an objective look at the number of exhibitors and the sheer size of the venue reveals that this will be the biggest Amiga show ever in this country.

The World of Commodore show will be held at Earls Court II from November 15 to 17. For full details of bookings and travel arrangements, see the World of Commodore advertisement on page 110.

Mastering directories made easy

YET ANOTHER disk utility program for those who can't be sure of Shell makes its debut this month. *Directory Opus* from INOVAtronics provides the standard file handling features such as two directory windows for file copying, renaming and so on.

It also enables the user to view IFF pictures, brushes and animations, hear sound files, read text files and run executables by clicking on their filenames. An on-line help feature is included, as is an ARexx port. It requires 1Mb to run, costs £45 and is available from UK distributor Checkmate Digital ☎ 071-923 0658. INOVAtronics can be contacted directly on ☎ 010 1 214 340 4991.



This floating Amiga is courtesy of the ever buoyant staff of Evesham Micros, who hope to raise £10,000 for the BBC Children In Need appeal in November. To this end, they're asking customers to donate a pound in return for a balloon race ticket. The lucky winner of the race will take away an A500, monitor and an Atari Lynx games console.

The Amiga on CD

NOW YOU can hear the tunes from your favourite games in comfort, without the bothersome need to shoot aliens. Digital Dreams has taken the innovative step of releasing a line of CDs filled with great computer tunes of our time.

Two CDs are available at the moment, one with tunes from a selection of Gremlin Graphics games lasting 52 minutes, the other with 58 minutes of tunes from the games of Psygnosis.

The idea is not all new. The Pixies recently recorded a version of *The Theme From Narc* in their own inimitable style. Digital Dreams' offerings, however, take the music direct from the Amiga. The only change occurred in re-mastering, when the stereo panning was made more central to compensate for the Amiga's extreme left and right positioning of sound channels.

The discs cost £14.99 for the pair, and are available from Digital Dreams on ☎ 0602 754991.

Super genlock

THE RENDALE 8802 genlock has been revamped to 'super' status. New features include: Super VHS in and out, composite in and out, fade Amiga to black, fade video to black, cross fade, cross wipe, foreground/background mode, fade out Amiga, and fade out video.

The price is £599.99; users of the old Rendale can obtain an upgrade – price available on application. The genlock is distributed by Marcam ☎ 081-941 6117.

AKA anti-alias

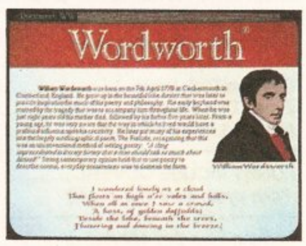
A PROGRAM for removing the jaggies from your bitmap fonts, called *AntiA*, has just been announced by Zen Computer Services. It will take any Amiga bitmap font, produce up to nine scaled-down sizes and then save the results as ColorFont data which can be used in any non-HAM application or even converted to work with programs such as *Broadcast Titler 2*. The program costs £39.95. Zen Computer Services ☎ 061-793 1931.

Wordworth

a writer's dream

The graphical nature of Wordworth® makes producing documents faster and easier. The WYSIWYG display shows exactly how your printed document will look, different fonts, styles and sizes, headers and footers, graphics and so on.

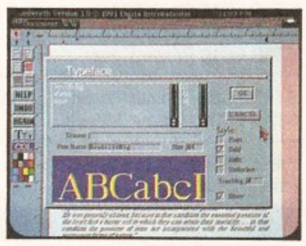
Commands are grouped under a series of pull-down menus, accessible either by the mouse or keyboard. Frequently used commands have on-screen icons, including Help, should you need it.



Experience the look and feel of the new and exciting WB2 (even if you use WB1.3).

Digita's® innovative *Human Interface Protocol*™ is incorporated and sets new standards in speed, style and elegance. Each document is a separate multi-tasking window, which means you could for example, print one while editing another.

Graphics have always been the Amiga's strong point. Now it's better than ever. Pictures from Deluxe Paint can be placed in a document, and then sized, scaled and dragged (text automatically reformats around the image).

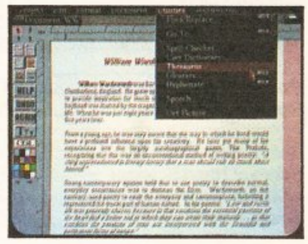


Wordworth's enhanced fonts will give you the very best printed quality. You can also print special symbols, such as boxes, arrows and so on. Better still, you can mix graphics, Wordworth's enhanced fonts, Amiga fonts, Colorfonts and your printer's own fonts, all on the same page.

Wordworth integrates with most word processors, and so you'll be able to use any documents created with Kindwords, Wordperfect, Prowrite, Protext, Excellence, and any ASCII or IFF Text document.

As Amiga Computing put it, "the only Amiga word processor to rival Protext for speed. I would recommend the program to anyone thinking of buying their first word processor or upgrading from Kindwords."

Wordworth is written in the UK by Digita. Which means you'll be using an English Collins spelling checker and thesaurus, and you'll know where to come for professional support.

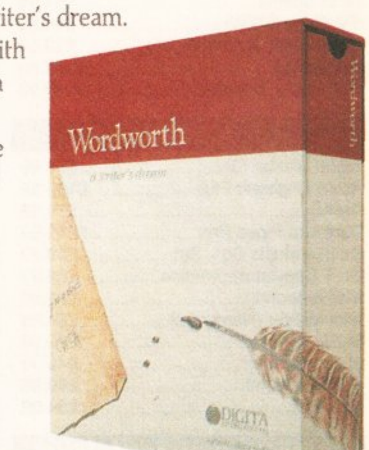


When Amiga Format said "a new word processor that will give the rest of the world a run for its money" they weren't joking. "Wordworth is the most user-friendly word publisher on the Amiga." Praise indeed.

The only way to really appreciate Wordworth is to use it. Phone 0395 270273 for more information or, write to Digita, FREEPOST, Exmouth EX8 2YZ.

Wordworth costs £129.99, which includes VAT, postage and packing. If you already own a word processor and purchase Wordworth direct from Digita, you can save £30 by returning your original disks with your order.

Wordworth will be your writer's dream. However, if you don't agree with us (and purchased directly from Digita), return it in original condition within 7 days and we will refund your money.



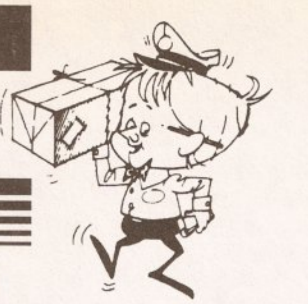
Machine support
Written specifically for the Amiga
Fully supports WBV 1.3 and V2.00
Supports all medium or high resolution modes (mono and colour)
Requires 1MB of memory

DIGITA® INTERNATIONAL

software thats right™

Digita International Ltd Black Horse House Exmouth EX8 1JL ENGLAND Tel: 0395 270273 Fax: 0395 268893

BYTEBACK



FAST DELIVERY SERVICE ....and the keenest prices

Ring us now! **0636-79097** we're programmed to help

FIND OUT WHY MOST AMIGA USERS PREFER BYTEBACK!

ART AND DESIGN

3D Construction Kit	£32.99
Amiga Graphics Starter Kit	£24.99
Deluxe Print (2)	£34.99
Deluxe Paint (3)	£59.99
Director (2)	£79.99
Disney Animation Studio	£79.99
Fantavision	£29.99
Icon Paint	£14.99
Imagine 3D	£174.99
Photon Paint	£19.99
Pixmate	£39.99
Professional Draw (2)	£99.99
Real Things - Birds 1 & 2	£23.99
Real Things - Humans	£23.99
Real Things - Horses	£19.99
Spectra Colour	£54.99
The Art Department	£54.99
X-Cad Designer	£89.99
Podscat 12 x 12 Tablet	**£179.99**
Podscat Drivers	**£22.99**
Colourburst Tablet	£519.99
Pandaal Hand Scanner	£159.99
JX100 Scanner	£579.99
Scanlab Software for above	£69.99

VIDEO

Broadcast Titler	£199.99
Deluxe Video III	£59.99
Digiview GOLD (4)	£129.99
G2 Broadcast Videocentre	£549.99
HBM Genlock	£149.99
Home Titler	£29.99
MiniGen	£104.99
Panasonic WV1410 Video Camera (including lens)	**£229.99**
RGB Splitter	£64.99
TV Show (NEW)	£54.99
Video Titler 3D (NEW 1.5)	£79.99
Vidi Amiga	£119.99
Vidi Colour Solution	£169.99

MUSIC

Audio Master (3)	£54.99
Ausio Engineer Plus	£169.99
AMAS	£79.99
Bars and Pipes Pro	£219.99
Deluxe Music Con. Set	£49.99
Dr. T Copyist Apprentice	£69.99
Mastersound	£29.99
Midi Master (Hardware)	£34.99
Music X (1.1)	£99.99
Music X Junior	£49.99
Perfect Sound	£49.99
Quartet	£34.99

GAMES - (ask for full list)

AMOS - Games Creator	£34.99
Chessmaster 2100	£19.99
Dungeon Master	£15.99
Flames of Freedom (Mid 2)	£19.99
F19 Stealth Fighter	£19.99
Jahangir Khan Squash	£17.99
Lemmings	£17.99
Life and Death (Mb)	£16.99
Railroad Tycoon	£23.99

BUSINESS

Cashbook	£39.99
Day by Day	£22.99
DG Calc	£27.99
Final Accounts	£22.99
Home Accounts	£22.99
Interspread	£39.99
Mailshot Plus	£39.99
Personal Tax Planner	£27.99
System 3	£39.99

BUSINESS PACKS

Cashbook Combo	£49.99
Gold Disk Office	£99.99
Kind Words + Organise	£49.99
Works Platinum	£74.99

WORD PROCESSORS

Excellence	£84.99
Interword	£39.99
Kind Words	£34.99
Pen Pal	£63.99
Protext (5)	£119.99
Scribble Platinum	£42.99
Wordworth	£74.99

DESK TOP PUBLISHING

Pagesetter (2)	£49.99
Page Stream 2.1	£149.99
PRO Clips (Clip Art)	£19.99
Professional Page	£184.99

UTILITIES

BBC Emulator	£34.99
Cross - Dos (4)	£27.99
Dos to Dos	£39.99
Distant Suns	£34.99
GB Route	£27.99
Hisoft Basic	£59.99
X-COPY PROFESSIONAL (3.3) plus CYCLONE & Hardware! plus Hard Disk backup	**£34.99**
Vista	£35.99
Workbench 1.3	£14.99

EDUCATIONAL

Dinosaur Discovery Kit	£17.99
First Letters and Words	£17.99
Mickey's Runaway Zoo	£16.99
Donald's Alphabet Chase	£16.99
Goofy's Railway Express	£16.99
Fun School 2 (Under 6)	£12.99
Fun School 2 (6 to 8)	£12.99
Fun School 2 (Over 8)	£12.99
Fun School 3 (Under 5)	£15.99
Fun School 3 (5 to 7)	£15.99
Fun School 3 (Over 7)	£15.99
Micro English (GCSE)	£18.99
Micro Maths (GCSE)	£18.99
Micro French (GCSE)	£18.99
Postman Pat	£8.99
Shapes and Colours	£6.99
The Three Bears Adventure	£17.99

DISKS 100% Guaranteed!

10 SONY Branded disks	£8.99
20 SONY Branded disks + FREE Calculator	£15.99
150 Disks + Labels + Posso Media Box	£69.99
10 Disks + Labels	£4.49
50 Disks + Labels	£20.99
100 Disks + Labels	£39.99
500 Disks + Labels	£169.99
1000 Disks + Labels	£329.99
100 Disk Labels	£1.49

HARDWARE

Naksha Mouse + Mat, Bracket	£19.99
Naksha Mouse + Mat, Bracket + Operation Stealth game	£24.99
Cumana Disk Drive	£59.99
Zydek Disk Drive	£52.99
Adspeed Double Speed	£199.99
FURRY MOUSE COVER! (with eyes, ears and nose!)	£6.99
Locking Disk Box (40+)	£6.99
Media Box (150 - Stackable)	£19.99
Mouse Mat	£3.99
Keyboard or Monitor Cover	£5.99

MEMORY EXPANSIONS

500K RAM Expansion!	£29.99
500K RAM + DUNGEON MASTER	£44.99
500K RAM + KICK OFF 2 (Mb)	£44.99
1.5 Megabyte Internal RAM	£109.99

PRINTERS

STAR LC10 Printer	£169.99
STAR LC10 Black Ribbon	£3.99
STAR LC10 Colour Ribbon	£5.99
STAR LC10 Printer Cover	£6.99
STAR LC200 Colour Printer	£209.99
STAR LC200 Colour Ribbon	£6.99
Printer Stand	£9.99
Printer Lead	£4.99

BOOKS

Amiga for Beginners	£12.99
Amiga Basic Inside & Out	£18.99
Machine Language	£14.99
Tricks and Tips	£14.99
Amiga DOS Inside and Out	£18.99
Tricks and Tips (Vol.2)	£14.99
System Programs	£32.99
Disk Drives Inside and Out	£27.99
Amiga Graphics In & Out	£29.99
Programs disks for above	£13.99
Hardware Reference Manual	£21.99
ROM Kernal Manual	£28.99
Kids and the Amiga	£13.99
Second Book of the Amiga	£16.99

PUBLIC DOMAIN

1 disk	£1.25
10 disks + File box	£9.99
20 disks + 2 File boxes	£17.99

Ask for our NEW catalogue!

AU.01 Jazzbench; Superb Workbench replacement; full multitasking!
AU.03 QL Emulator; plus 2 disks full of programs. (3 Disks : £3.75)
AU.13 Visicalc; Superb Spreadsheet!
AU.18 North C; Programming language
AU.20 K.O. The Virus (3); Virus X plus BB Champion, Red Alert...
AU.22 Text Plus (2.2); High Quality Word Processor with many features!
AU.23 Word Wright; Word Processor. Plus: Amgia Spell; Spell Checker!
AU.24 Spectrum Emulator; Run some Spectrum games on your Amiga!
AU.26 Complete C Manual; packed with information on C programming plus 70 examples! (3 Disks : £3.75)
AU.27 Amibase (3.76); Professional quality, multi-featured database includes an example 'Books' file.

AE.01 Blackboard Maths; addition to multiplication. Colourpad; On screen colouring book. Plus: Games...
AE.08 Fun Time; Fun School quality educational fun for pre-school children, 5 games (2 Disk : £2.50)

SND.01 Soundtracker; Four versions of this superb PD music program!
SND.02 Soundtracker 4; Alternative Blue version, coupled with complete Instruments disk! (2 Disks : £2.50)
STI.01 to 08 Instruments; 100's on each disk, use with Soundtracker! (8 disks : £7.99 or £1.25 each)
STS.01 to 02 Samples; Superb Sound samples, use with Soundtracker! (2 disks : £1.99 or £1.25 each)

AW.02 Workbench Plus; TVText demo, Fractals, Virus X, Clip It, DMouse
AW.03 Icons; 100's including; the amusing Naughty Icons, Ram icons, Music Icons...plus Icon utilities.
AW.04 Icon Development; Design your own Icons or use one of the numerous examples. Plus Slideshow program!

AC.02 Pagesetter Art; 100's of professional quality clip art pics.
AC.04 IFF Alphabets; 30 screens of high quality fonts plus surfaces.

AF.01 Cosmopolitan Fonts; AV-Guard, Basel, Celtic, Geneva, Monaco...
AF.02 Fancy Fonts; Bubbles, Future, Broadway, Park Avenue, Courier...
AF.03 Publishers Fonts; Helvetica, Bookman, Microsoft, Long Island...
AF.04 Fonts; Unusual fonts, Large and Small fonts, Videofonts...
Plus: Various Font Utilities!

All prices include VAT and FIRST CLASS POST!
GUARANTEED RETURN OF POST DELIVERY ON ALL STOCK ITEMS!

BYTEBACK

DEPT ASH, 6 MUMBY CLOSE, NEWARK, NOTTS NG24 1JE

Cheque, postal orders or credit card facilities are available

Access VISA

In Brief

BLITSOFT BACKUP

A disk utility, consisting of both hardware and software, is being released by Blitsoft.

Called SYBIL, the device enables file transfers between Amiga, PC, Mac and Atari formats, as well as increasing disk storage capacity to 1.12Mb. Such disks can nevertheless be read by those not blessed with SYBIL.

Other features are a disk compressor and what is euphemistically described as a back-up system. It costs £89 from Blitsoft ☎ 0908 666265.

BIOLOGY LESSONS

Put an end to all of that traipsing through forests and staring down microscopes with *MicroMeasure* from Think Limited. The program, with the aid of a genlock and a video source, will enable length and area measurements to be taken, via a point-and-click interface, of objects on the video.

The program is expected to be of use to biologists and earth scientists. It is available to schools for £135.13; to others for £581.63. Think Limited ☎ 021-384 4168.

GRAPHICS GALORE

Those salivating at the thought of an A3000 but quaking at the thought of an hysterical bank manager may be interested in the Graphics Workstation from Bytes and Pieces.

At £1,999, it consists of a revision 6A motherboard with a CSA 68030 clocked at either 25 or 33MHz and a co-processor. 2Mb of 32-bit RAM is supplied as standard, along with 512K of static RAM. Also included is 2Mb of Chip RAM, a flicker fixer and a 52Mb hard drive. Bytes and Pieces ☎ 0253 795376.

BUDGET ACCELERATOR SELLS OUT ALREADY

RARELY THESE days do we see a peripheral that out-sells supplies before it's even advertised, but Microbotics, who recently signed up with Birmingham-based ZCL has done just that with the VXL30, a low-cost 68030 board compatible with all Amigas that retails for less than an ordinary A500.

Although performance details were not available at time of going to press, the basic 25MHz unit, selling at £316 inc. VAT, instantly converts the machine into something like an Amiga 3000! And for those with a thirst for real speed, a 40MHz version is available for just £575.

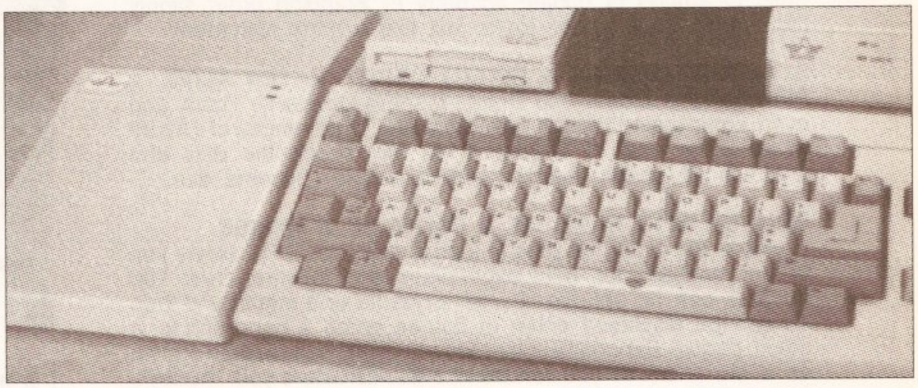
Although there are cheaper cards on the market, ZCL claims the VXL30 is the most compatible, having its own 68000 already in place. Maths-intensive programs can use the optional 68882 running at 25MHz for an extra £165; while memory hungry users can get 2Mb of paged RAM for £234 or 2Mb of burst RAM for £316.

The board has already proved so popular that ZCL had installed its original shipment of some 500 units before any advertising had been booked! We'll be giving the VXL30 a thorough work-out shortly. ZCL ☎ 0543 414817.

Drives solid as a Roc

DISK DRIVE specialist Roctec Electronics is preparing to start another price war with a new range of high-quality, budget-priced Amiga floppy and hard disk drives and genlocks, *writes Mark Smiddy.*

Previously almost unheard of, Roctec made its debut in *Amiga Shopper*'s April supplement issue where it received a coveted *Amiga Shopper* Best Budget Buy award for its RF332C slimline drive.



The new Roctec range: hard disk, two colours of floppy and the RocGen Plus genlock.

Included in the new line-up is the Roclite, a new version of the RF332C floppy drive. Supplied in a specially designed anodised aluminium case, the Roclite comes in white for the Amiga (for about £60) and black for the CDTV and design-conscious Amiga users (for about £65).

Swiftly following this is the yet unnamed A590-bashing hard drive. Fast enough to frighten your granny, the drive employs a 18ms, 42Mb IDE drive, games switch, SCSI through-port and unpopulated RAM board for 8Mb of Fast RAM. Housed in a newly designed ABS case, colour and contour matched to the A500, the drive is expected to retail at £299!

Backing up the new line-up is Roctec's genlock to beat them all. The RocGen Plus, successor to the continuing RocGen, features more advanced mix and fading facilities as well as RGB/computer pass-through and has inputs provided for Roctec's advanced colour keying unit. Price is expected to be under £180.

Located in Hong Kong, Roctec's operation employs almost 1,600 people, and has specialised in producing 'unbadged' equipment for some years now. According to director Jimmy Lo, the April review convinced the company that the time was right to adopt a proper corporate image; so all new products will carry the distinctive Eagle-like 'Roc' logo.

At the time of going to press, Roctec has yet to confirm UK distribution details, but expect to see reviews soon.

More fun out of school

PARENTS WHOSE children have exhausted the delights of *Fun School 3* will be pleased to know that a sequel is on its way. Called, appropriately enough, *Fun School 4*, the package contains educational games that follow National Curriculum guidelines.

Teddy and Freddie the Frog, two characters from the previous package, make the transition smoothly, but Robbie the Robot has been dropped in favour of Sammy the Spy, who is apparently more 'street cred' according to politically aware kids.

The games cater for children up to eleven years old, and cover topics such as art, maths, words, karaoke(!), sequences, typing, geography and history. *Fun School 4* will cost £24.99 and will be available from Europress Software ☎ 0625 859333.

DIARY DATES

October 6: **All Formats Computer Fair**. The Brunel Centre, Bristol. ☎ 0225 868100.

October 29-31: **Image Processing '91**. National Exhibition Centre, Birmingham. Blenheim Online ☎ 081-868 4466.

October 31: **Computer Animation Festival**. The Odeon, Marble Arch, London. Blenheim Online ☎ 081-868 4466.

November 3: **All Formats Computer Fair**. Royal Horticultural Hall, London. ☎ 0225 868100.

November 5-7: **Computer Graphics '91**. Alexandra Palace, London. Blenheim Online ☎ 081-868 4466.

Cock-up corner

We printed the wrong price for New Horizons' *ProWrite* package last month – it should be £129.95.

There were a number of errors in Jon Bates' review of Gajits' *CMpanion* package. It can copy a partial from one tone into another. *CMpanion* will work with the MT-32, the CM-32L, the CM-32P and the CM-64, not with the D-range of synths. Gajits do produce other voicing software for the Amiga: *4D Companion* covers the Roland D-10, D-20 and D-110 synths. *CMpanion* does allow random tone editing.

Buying an Amiga? Don't miss the next *Amiga Shopper*, out November 7

THE BEST ST HOME FINANCE PROGRAM NOW AVAILABLE FOR THE AMIGA

AMIGA VERSION

*** FULL MULTI TASKING**
*** OVER 100 BUDGETS SELECTABLE (10 ANALYSABLE)**

Personal Finance Manager

£29.95

–The Worlds Most Sophisticated Personal Finance Program–

If you run a personal bank account and have a Commodore Amiga then you need "PERSONAL FINANCE MANAGER".

AS EASY TO USE AS A CALCULATOR
PFM makes full use of Amiga's Workbench interface, if you need to amend or update an entry or Standing order simply click on it. Your screen looks just like a bank statement!

STANDING ORDERS & DIRECT DEBITS EATEN ALIVE
PFM handles Credit and Debit - Monthly,Quarterly, Yearly and even complicated regular payments like 12 payments of £52.99 followed by one of £12.50, PFM will check the date and automatically insert standing orders as they become due.

BUDGET WITH EASE, AT A CLICK OF A MOUSE.
If you're the type that likes to look ahead then PFM allows you to set budgets for both expenditure and income. Over 100 budgets can be set over a year, a quarter or a month and then 10 can be displayed either in figures or as a bar graph for a given period. Expenditure for these budgets can also be shown as a pie chart so you can tell at a glance where your money's gone. PFM also allows you to display or print your budget groups selectively so you can see your expenditure quickly and easily.

BALANCING WITH YOUR BANK ACCOUNT IS NO LONGER A JUGGLING ACT
When you get your bank account statement or a balance from an autobank machine you can confirm it with PFM quickly and easily. Simply select PFM's unique "Auto Balance" option and type in the balance as given by the bank and PFM will attempt to balance and highlight entries that have not yet been processed through the bank.

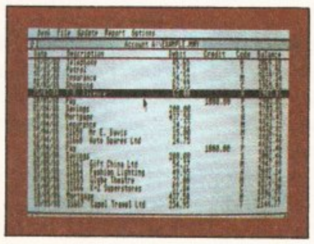


Home Finance Program By Peter Veale.
Amiga Version by Dan Lennard.

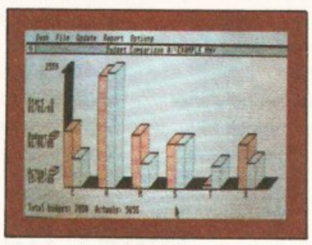
Here's what the critics say:
"PFM is one of those rare programs with which it is easy to feel comfortable from the first time you run it."
Ron Massey, ST USER

"Personal Finance Manager is a sophisticated home financial package, it will probably help you save money."
ST UPDATE.

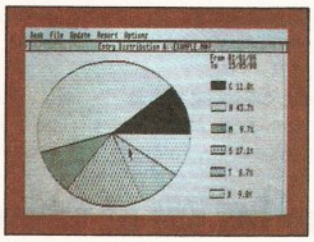
"PFM is just the ticket if your expenditure is as disorganised as mine."
POPULAR COMPUTING WEEKLY.



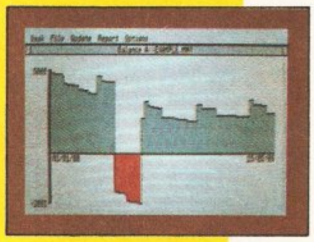
MAIN ACCOUNT SCREEN



BUDGET COMPARISON BAR-GRAPH SHOWING BUDGETS & ACTUAL EXPENDITURE OR INCOME



PIE CHART SHOWING SELECTED ENTRIES OVER CHOSEN DATES



BALANCE DISPLAY SHOWING HIGHS & LOWS OVER SELECTED DATES

OTHER FEATURES

* The number of entries is limited only by memory size
* You define the file size
* Old entries are automatically deleted
* Automatically places entries in date order
* European or U.S.A. date formats
* Balance of account graph
* Moveable and re-sizeable windows
* Run multiple bank accounts by simply using different file names. Multi-Tasking allows Multi-Account access.
* Facility to check off items against statements
* Locates cheques written months ago in seconds
* Selective print features for dates/statements/standing orders and budgets.

Free 30-Day Trial
Order direct from MICHTRON and if you are not 100% satisfied, return within 30 days for a full refund.

NOT COPY PROTECTED

TO ORDER:
SEND TO: MICHTRON
PO BOX 68, St. Austell,
Cornwall. PL25 4YB.
Allow 28 Days for delivery.

BY PHONE:
WITH CREDIT CARDS.
TELE: (0726) 68020.
£30.95 (incl P&P).

AMIGA VERSION

Please send me **Personal Finance Manager** at £30.95 (incl P&P)

☐ Cheque enclosed made payable to MICHTRON

☐ Please debit my credit card account:

☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ Expiry date:

Name ______________________

Address ______________________

______________________ Signed: ______________________

MichTron®

Talking Shop

This is the space which we give over to you to have your say every month. Throw in your ha'penny-worth and you could pick up a whole £5. Your host, as ever in these matters, is the editor – Stuart Anderton.



We've had a large number of letters this month on the suitability of the Amiga for college work. Here's a small selection of them:

Although every university or polytechnic may have their pet software package and computer environment, they all have MS-DOS compatibility in common. It is for this reason that I must advise anyone considering any form of higher education not to buy an Amiga. I have had a lot of enjoyment from my machine but more and more I find that my Amiga falls very short of my computing requirements.

Steve C Robinson
Wakefield
Yorkshire

We are forced towards using PCs as that is all we have at my polytechnic (South West, Plymouth), apart from the mainframes. I have been using PCs now for about three years and have had an Amiga for a year and a half, and quite honestly, the Amiga is by far the better machine. But the fact remains that it is not, and will probably never be, an industry standard computer because it is not taken seriously enough by Commodore. The 500 series is basically just an extremely powerful games machine and the 2000 is too expensive at the moment for most students.

Mark A Williams
Ivybridge
Devon

In my studies I deal with many foreign scripts such as Arabic, Hebrew, Egyptian hieroglyphs and other such weird and wonderful beasts. I stand in awe of friends who use PCs and Macs and are able to liberally dose their texts with professional scripts using true right-to-left editing, and wonder why I, as a lowly Amiga user, have been ignored by the manufacturers of more professional software enjoyed by these lesser machines.

Jeff Lloyd
Leith
Edinburgh

Most of my colleagues have been left unemployed this summer, and I know of at least one whose plans to buy a PC have been shelved as a result. Even when the purchase becomes possible, I suspect that his decision will be dictated more by the size of overdraft incurred than the advantages the Amiga offers. It would be nice if Commodore could make the decision obvious.

Nick Christie
Bournemouth
Dorset

Although the PC is obviously inferior to the Amiga, much better deals are available for PCs. Maybe if someone started making an Amiga-compatible computer, prices would come down.

Christopher Brown
Chesterfield
Derbyshire

I have been a fan of the Amiga for quite some time, and recently I have instilled the idea of buying an Amiga in some of my colleagues who want to own a computer like a Mac II but are without the financial resources to do so. I'm sure that if Commodore could see to educational users getting a discount, the Amiga would be put to good use in educational establishments.

Mohammed Said
Oxford University

It appears to be a little-known fact that students actually receive less income than someone on Income Support. After paying rent and college fees I am left with about £21 a week to pay all the bills, poll tax etc. Now it doesn't take a genius to realise that after paying for materials there isn't a lot left to buy equipment like Amigas.

Martyn Bibby
Normanton
Derby

At university we mainly have IBM and IBM-compatible machines. This means that they are not willing to accept work which has been completed on a non-IBM compatible machine.

I would say to any student considering buying a machine to help them with their work to seriously consider getting one which is compatible with the machines at their university.

Paul Ferry
Portsmouth
Hants

Overall our correspondents seem to be painting a rather depressing picture of the Amiga in higher education. But what could Commodore do to get the Amiga accepted as a serious machine for academic use? Your ideas please.

TYPE MISMATCH

In issue 5 a reader from Manchester wrote in complaining about the C programming tutorials. May I point

continued on page 14

Fewer reviews, more advice

It seems to me that you may have begun to fall into the trap of some of the games mags. The trap is to constantly review the latest releases. Yes, some of your magazine must contain reviews of the latest developments, but the reality is that once most of us have bought a piece of expensive software we are only vaguely interested in what the next best thing can do. Instead we want to perfect our technique on our own systems.

I suggest that you devote at least half of your DTP column to some of the ideas hinted at in my *Amiga Shopper* DTP cover (right). These ideas are not specific to a particular package but are aimed at helping all desktop publishers improve their trade and link them more closely to *Amiga Shopper* as a serious users' magazine.

Kevin Beswick
Wollaton
Nottingham



• A few suggestions from Kevin.

You'll find more and more tutorials in these pages in future. For instance, in this issue you'll find 'how-to' articles on C and Basic programming, MIDI, *MessyDOS*, AmigaDOS, database analysis and setting up a DTP system. Future articles will look at graphics, page layout, sequencing... you name it.

continued from page 13

out that there is more than one type of beginner. Those who have not touched a computer before, those who have used non-Amiga computers before and those who know how to program on other machines. I am in this last category and find the series ideal.

The articles show me how to make use of the Amiga operating system without patronising my programming ability. By all means have tutorial on how to program. But cater for one type of beginner at a time, by keeping the two articles separate. Otherwise one group of readers will be 'in at the deep end' and rest will feel patronised.

P K Attwood
St. Peter
Jersey

SINCE YOU ASK

Having heard that the European Computer Entertainment Show has been cancelled, could you tell me if there any other shows being held before Christmas?

Hamish Shah
Friern Barnet
London

Bit of a coincidence that you ask that Hamish, because only this morning our ever commercially-minded publisher, Greg, grabbed me by the ear and gave me a gentle reminder which went something like this:

"If you forget to plug our World of Commodore Show mercilessly in this issue you're sacked. Remember: November 15-17, Earls Court 2. And print this advert for good measure. Onwards, upwards, bigger, better, more." And then he wandered off to write lots of letters to trade magazines. Greg's advert, telling you all about the show and how unmissable it is, is on page 110.

GREEN ADVICE

With the recent concerns for the environment, I think computer companies should give their support to this matter. I don't mean that these companies should start giving their profits away to such organisations as Greenpeace – there is a simpler way. Cut down on large boxes and other packaging.

Many titles for the Amiga, be they serious or entertainment applications, come in big, bulky boxes which really aren't necessary to house the product. Usually the excuse is that a large manual is required, but reducing the size of the print would mean smaller books and, ultimately, less packaging.

If companies do wish to help the environment, they could at least give this idea a try.

Stuart N Hardy
Sheffield

To be honest Stuart, the environmental impact of cardboard boxes is pretty much nil. The trees which make cardboard are farmed just like any other crop, mainly in Scandinavia. And of course they're fully biodegradable. What would be nice is if there could be an agreed standard size for boxes, so they all looked neat and tidy on the shelf.

COLOUR CHECK OUT

Would you please ask Gary Whiteley to double check a couple of the statements he made in his article on Rombo's Complete Colour Solution (*Amiga Shopper* 5).

1. "Rombo has also bundled *Photon Paint 2* in the package." The package I purchased in May had version 1 included which, among other things, does not animate.

2. "You can always load files into *Deluxe Paint III*." Every time I try to do this I get a message: "Sorry cannot load HAM pictures".

If Gary knows how to get round these problems I would be pleased to hear it, as I thought I would have to patiently wait for my *Deluxe Paint IV* to arrive before I could animate video pictures grabbed with Rombo's package.

Les Rushbrook
Stevenage
Herts

I'm afraid we were wrong on both counts; it is the original *Photon Paint* included in the package, and, of course, *Deluxe Paint III* cannot handle HAM images. As you say, *Deluxe Paint IV*, which is now out, will solve your problems.

MISERLY LETTER

If this letter is published, I will earn £5. However, I will have to pay the £4.99 bank fee to get my cash in good old Norwegian currency. Would it not be better if all foreign readers could add the prize money to their subscription? So, for example, they would receive two or three copies more, without having to pay the additional bank fee.

Karl Ivar Dahl
Lillehammer
Norway

Not all our foreign readers have subscriptions. We hope to start offering a gift instead of a fiver in the future; meanwhile, your cheque for 1p is in the post.

ONE PLUS ONE IS...

With regard to the subscription ad on page 61 of issue 5. I can save time! I can save trouble! I'm guaranteed my copy! I'll even get a free gift! But it won't be less than I would pay at a newsagent.

My 10-year-old son tells me that 12 x 99p = £11.88, not £11.98. Less would be £11.87. I've subscribed anyway. Quality is worth the extra.

Ian Thomson
Balmedie
Aberdeen

We've bought the subs department a pocket calculator, so it shouldn't happen again.

GETTING THE FAX

I have the occasional need to use a fax machine, but not often enough to justify the cost of owning one. I have an idea for a cheap, cut-down version and I would appreciate your comments on it.

It would be a self-contained unit, with the modem part of a fax machine connected to the Amiga via the RS232 port It would also have a controlled mains socket, with an override switch for normal use and sending of faxes, and a fax received indicator.

The principle of operation is that upon detecting an incoming fax signal the mains socket, into which the Amiga (and probably its

On the C side

There's no such thing as the perfect language, but...

I would like to comment on Mr Pellatt's letter concerning C and Modula 2. First I would like to state that I wish only to address certain issues raised in the letter, I have no wish to start a "my language is better than yours" debate as we are all much too civilised for that, and the selection of a programming language is a personal choice.

Mr Pellatt says that it is impossible to write reliable programs in C; I must disagree with this. It is possible to write reliable and maintainable programs in C, and I do so both at home and at work. One of the problems is that C is a free-format language and as such program style can be wide open to abuse by neophyte programmers. A maintainable program, in my opinion, is one that makes good use of program style, function decomposition, data privacy through correct use of scope and block structure, and judicious use of comments. All of this is possible in C. In fact maintainability, reliability and structure are more the function of the programmer than the programming language, a programming language is just a tool for the programmer's use. A language that imposes few style restrictions of its own can be widely abused by the wrong sort of programmers, but that's not the fault of the language. Before I even started using high level languages, I was writing structured programs in assembly language – believe me, it is possible! Conversely it is also possible to write very unstructured code in the so-called structured languages.

Concerning C's use of special characters and symbols, I feel that whatever syntax a programming language uses is irrelevant, as (just like a human language) once mastered, the syntax of a program that adheres to good style can be understood with little difficulty. What use is meaningful English to a foreign programmer who does not understand a word of English?

Concerning mixing variable types, I personally am not happy with any language that does not let you mix data types as this can make expressing certain programming problems extremely difficult. For example, my field of work is image processing using transputers where 8-bit grey-scale images are represented as C 'unsigned chars', thus a 512 by 512 image requires 256,000 bytes of memory store. Many image processing operations make use of normalised histograms to manipulate data, and these histograms are typically arrays of type double whose sum value is 1.0 and so must use floating point data types. How would a language

peripherals) is plugged, would become live, the unit would send a wait signal to the sender of the fax while the boot disk, which you have remembered to leave in df0:, sets up the Amiga. This then turns off the wait signal, starts to receive data and save it to disk.

After the sender has disconnected, the Amiga finishes its work, turns off the mains socket via the RS232 link and finally goes back to sleep.

Faxes to be sent would have to be typed in, or drawn using a paint program, although some things like bills or receipts would require a hand scanner. The software could handle the dialling out and tie together the input material whether typed, drawn or scanned. The market for the unit would consist of any self-booting computer with an RS232 port.

R Brady
West Molesey
Surrey

Similar devices do exist for other machines. For instance, there is a Macintosh add-on which allows you to dial up a remote Mac, switch it on with the special modem, and then copy any files you like. Certainly there is no reason in principle why it could not be done. However, the cost of a fax modem and the hardware to switch on the Amiga wouldn't be vastly cheaper than, say, an Amstrad fax. Nevertheless, if someone builds such a thing, do let us know.

SINISTER LETTER

Have you noticed how biased the A500 is against us left-handed users? I would never consider getting a hard drive. It would take up the space that I use for the mouse, and get completely in the way of my external drive. The same thing goes for freezer cartridges, and any hardware that uses the left edge connector.

Why doesn't someone produce an extension lead that would enable any hardware to be moved to the back of the machine? I realise that the power would need to be boosted in some way, and I don't know how it could be achieved – but it is possible, isn't it?

David Carter
Woking
Surrey

I don't see why not (cue dozens of letters explaining exactly why not). Are there any other ways that the Amiga southpaws are unfairly discriminated against?

RADIO RADIO

Wow! Radio modems! Love it! But wouldn't it be possible for those of us without a radio licence to use an ordinary shortwave receiver, a circuit to clean up the signal and a sound sampler to just listen in? It would give a cheap, if non-participant, insight into radio comms. Perhaps Cliff could set a Code Conundrum to decode Morse?

Mark Bunbidge
Larkefield
Kent

In theory, yes it's possible. However, most of the bands used for this sort of transmission are not covered by a normal shortwave receiver – you'd have to buy a special, rather expensive receiver. Another problem is that, according to a radio amateur I know, it's actually illegal to monitor many radio wavebands without a licence. Perhaps someone more 'in the know' could correct us if he's wrong about that?

PASCAL PRIMER

I'd quite like to see a series of tutorials on Pascal as I'm going back to Poly to finish my degree in September, and that's the language they teach where I'm studying. Hopefully, HiSoft will have got their fingers out and produced the final version of Pascal by then and I'll be able to work at home as well as college, but in the meantime a 'review' of a PD Pascal would come in very handy indeed.

Jon Jeffery
Caterham
Surrey

We hope to be taking a close look at the numerous public domain languages in a future issue. But you shouldn't have long to wait for HiSoft Pascal; it's due out in October "or soon after".

SCANDINAVIAN SYSOP

How do you set up and operate an Amiga bulletin board or user net? We here in Iceland are thinking about it, but haven't the faintest idea how!

Freyr Njardurk
Iceland

Another one for the future features list there, Freyr. Obviously it takes time to get these features written, and to find space in the mag for them, but we do listen to your requests so please carry on sending them in!

BASIC THOUGHTS

After the kids had finally gone to bed I started to read my new Amiga's manuals and generally find my way around. Looking for the Amiga Basic was the problem: the manual said it was, along with its manual, elsewhere in the package. But no, I couldn't find it anywhere.

I phoned the shop, and they advised me that it was no longer included and to buy AMOS. Why should I? I phoned Commodore Customer Services, they confirmed it was no longer included because it was old, slow and third parties made better programs. I was very upset about this, because it seemed I had, as it stood, bought a very expensive games console. I drew their attention to the manual but all I got was "It shouldn't be there". Some customer services!

Steven Boyd
Wickford
Essex

I'm not sure many will mourn the passing of Amiga Basic, but it does seem a bit thoughtless to leave references to it in the manual! AS

Send your letters to:
Stuart Anderton, Talking Shop, *Amiga Shopper*, 30 Monmouth Street, Bath BA1 2BW or e-mail them to amshopper@cix.compulink.co.uk.

which did not allow mixed data types in expressions cope with calculating a normalised image histogram, as there is an implicit type char to type double conversion in calculating the histogram? You could of course have your integer (0-255) image data stored as double type but this would require over two million bytes of storage for a 512 by 512 image, assuming type double requires eight bytes to represent it, and anyway pixels would have to be converted to double types in the first place.

The Inmos C compiler I program the transputers with has excellent diagnosis and will warn you of problems concerning mixed type arithmetic, such as loss of precision when converting from type double to type char. To eliminate this warning if this conversion is really what was intended, you use a type cast which also has the side-effect of documenting the program, i.e. reminding you that the expression is a mixed expression. Other compilers could learn a thing to two from the Inmos compiler's standard of diagnosis messages, but this illustrates that code diagnosis is a function of the compiler and not the programming language.

Concerning C's lack of array bounds checking, C was designed primarily for writing operating systems (Unix) and real-time systems where features like bounds checking can add too much time overhead. If a program really does need bounds checking then it is just as easy for the programmer to add it, you could even write your own macros to do this. C supports dynamic memory allocation, so it is impossible for the compiler to perform bounds checking on dynamically allocated arrays as the size of such arrays is unknown at compile time.

I have mentioned in this letter that the choice of programming language is, where possible, a personal choice. I chose C after years of programming real-time problems in assembly language. Up until I found C I had always been horrified by inefficient code produced by high level languages, which in my line of work is just as important as mantainability. C allows me to write structured, maintainable, code efficient programs with very little overhead when compared to assembler. This is all relevant for the Amiga, whose multi-tasking, graphical environment imposes a lot of overheads. There can't be many people who like to twiddle their thumbs waiting about for sluggish programs, no matter how well they are written in whatever language.

Finally I would like to finish this long-winded letter by saying that any programming language has its merits and drawbacks and there is always room for improvement. Just as Modula 2 is an improvement on Pascal, so C++ is an improvement on C and is well worth investigating. I wrote this letter because I felt that Mr Pellatt's letter was unjust towards C and I wanted to address some of the issues raised, for the benefit of readers who are unfamiliar with C and who might now have the wrong impression of the language. C is often criticised by high-level language purists who sit in academic ivory towers and who do not have to dirty their hands tackling programming problems associated with the real world.

D A Cook
Llandysul
Dyfed

I'm sure Messrs Kernigan and Ritchie are grateful for the spirited defence. You'll find more on the merits and otherwise of Modula 2 on page 97. Despite letters, phone calls, faxes and postcards we still haven't had the requisite 20 requests for a Modula 2 series; you have until the end of the month to get yours in.

3D or not 3D

Phil South takes a look at a wide range of the 3D graphics packages available and evaluates the best and worst of the batch



"3D graphics is a big market these days, so it's a bit hard to make the right choice of package. I'm here to help you make that choice."

Phil South

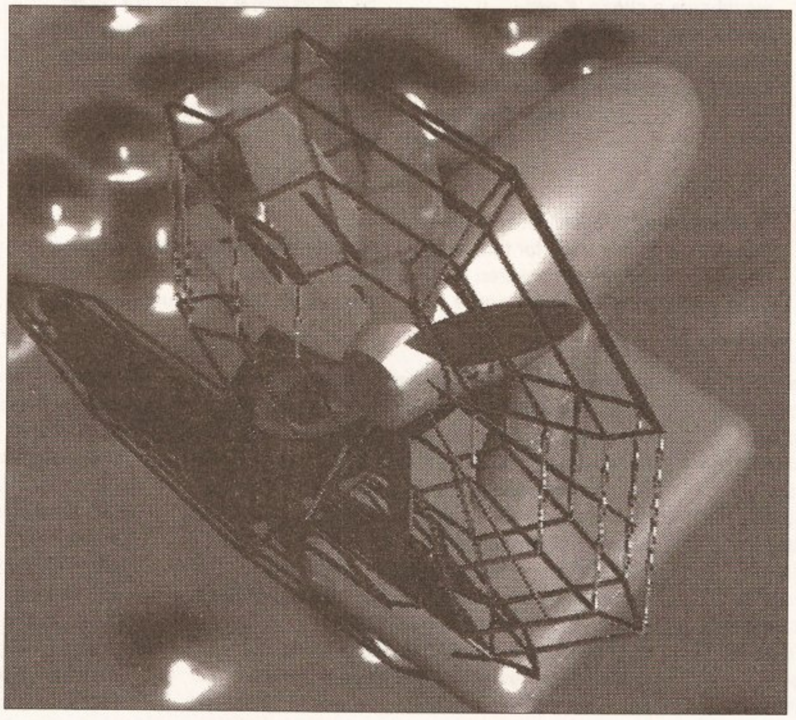
There was a time, and it really wasn't so long ago, that all my friends used to say "Why do you spend so much time playing with that computer when you could be having fun?" At the time, the computers I was using weren't that impressive. The graphics looked like a bad mosaic, and the sound was like a doorbell whose battery was running down.

But then I got an Amiga, and I showed all these sceptical friends something. They gaped, and most of them went out practically the next day and bought one themselves. Believe it or not, what I showed them was simply a very early demo called *Juggler*, a simple ray-traced animation created with a pre-release version of what was to be the Amiga's first 3D program, *Sculpt 3D*. This was a real thing that people could grasp, a real application, and graphics that could zonk your eyeballs out at 15 paces.

From then on computer graphics, especially those on the Amiga, have never looked back. Everyone can produce sparklingly realistic 3D rendered pictures in the privacy of their own home, and for not much money either. The programs we'll be looking at are *Imagine* (Impulse), *Real 3D* (Activa), *3D Professional* (Progressive Peripherals), and *Draw 4D* (Adspec), all of which represent the best of what is available in 3D packages in the UK today.

WHAT IS 3D?

There are many different sorts of 3D software available for the Amiga. Some allow you to create 3D vector graphics for games or demos, but that's not true 3D graphics. True 3D programs allow you to manipulate objects in space, light them, give them a surface texture and colour, and put them in a setting made of other objects. All of the 3D programs I mention here are animation stations as well, allowing you to create a sequence of frames, where the objects, lighting and 'camera' move exactly the way you want them to. These frames can later be combined together to make an animation, either as an ANIM file or similar compressed format, or sent frame-by-frame to video tape or to a frame buffer and from there to a video tape.



One of *Real 3D*'s impressive features is the way that it copes with bump mapping, producing effects like the one shown here.

WHAT'S THE BEST?

The best kind of 3D software is a package which makes you feel as though you can reach into the guts of the machine and pull the objects around with your bare hands. If the modeller feels like it's fighting you, then it can't be that good. Features-wise it's the image quality that counts. If someone says that a program is a full ray-tracer and all it turns out are gritty-looking low-res HAM images, or perhaps not even HAM, then it's not going to be any good, is it? Most of the programs mentioned here have a high resolution mode, and almost all can send to a frame buffer or 24-bit display card.

Every animator or digital artist has a favourite program, and this depends on what they've been using and for how long. I know some people who swear by *3D Professional*, whereas I find it a complete waste of time. That's the personal preference factor, and you can't get around it. You just have to agree to disagree.

WHAT IS MAPPING?

Mapping is the technique whereby a surface texture and colour are wrapped around an object to give it the characteristics (roughness, smoothness, bumpiness) of a real-world object. Not all the objects you see are perfectly smooth and shiny. Some have a skin texture – human beings, for example! Bump mapping is the art and science of putting little bumps on the surface of an object. If the object is shiny these bumps will catch the light, and in any case they would have to cast a shadow if they were real. The program takes an IFF file as its model – usually a monochrome image of a pattern using a number of different shades – and maps this to the shape. Cycled airbrush patches on the screen which have been cut out as brushes, for instance, normally work for most irregular bumpy tricky surfaces like oranges or other sorts of fruit. But you can do nice regular checked patterns too, which can be very effective.

THE 24-BIT REVOLUTION

The biggest advance in the last few years has been in the field of display graphics, and 24-bit cards have been leading the way. In the wake of such high performance engines as the Amiga Centre Scotland's Harlequin card come devices such as the HAM-E from Black Belt Systems, the Colorburst from MAST, and the Firecracker from Impulse which all deliver the same number of colours – 16-odd million of them. Also coming along real soon now is the GFXEngine from Solid State Leisure, but at the time of writing that is still in the beta testing stage. So high quality display is here, fast rendering times are here, what else? Well, a fast processor of some kind is very necessary if you want to do any kind of intensive 3D work, and essential if you want to do animation.

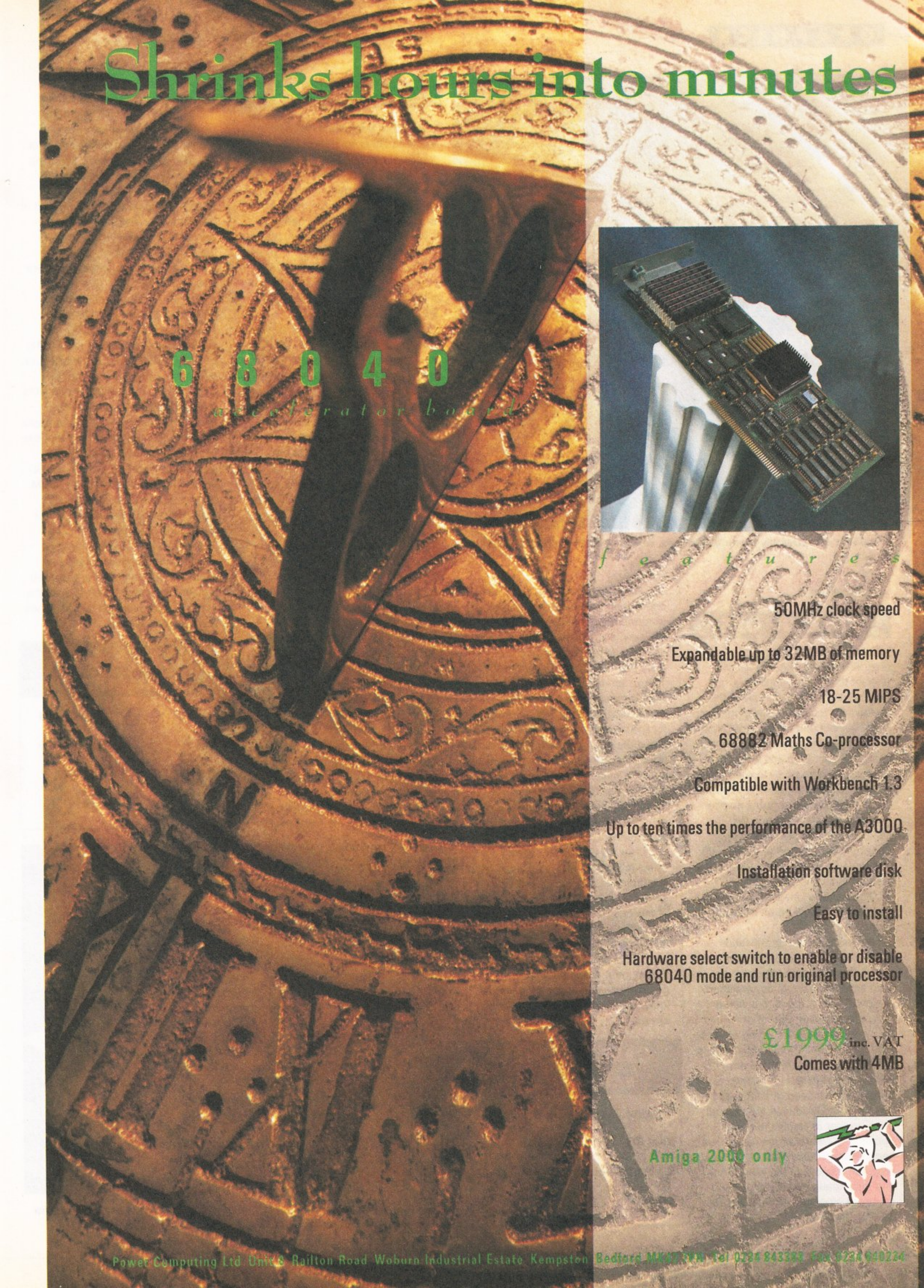
RENDERING FOR VIDEO

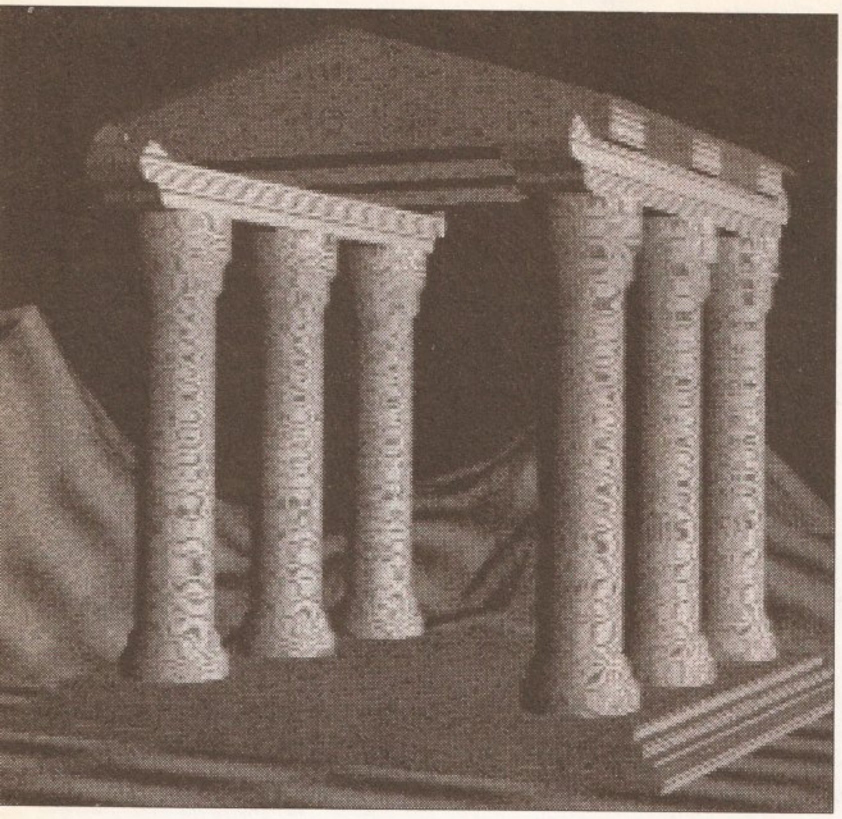
Putting animations together for video is best done using ArtBeat's Simpatica system. Although priced a little out of the amateur market, the equipment is good enough to warrant a look if you're semi-pro or even just rich with an interest in computer graphics.

In most cases, if you're doing fast moving graphics you don't need 24-bit quality; HAM will be good enough to do the job. But if the job needs more, then you'll have to stump up for 24-bit… although truth be told you could easily use something like the HAM-E to take you up to 256 colours and meet the problem part way.

So, let's look at the programs…

continued on page 18


Shrinks hours into minutes
6 8 0 4 0
accelerator board
features
50MHz clock speed
Expandable up to 32MB of memory
18-25 MIPS
68882 Maths Co-processor
Compatible with Workbench 1.3
Up to ten times the performance of the A3000
Installation software disk
Easy to install
Hardware select switch to enable or disable 68040 mode and run original processor
£1999 inc. VAT
Comes with 4MB
Amiga 2000 only
Power Computing Ltd Unit 8 Railton Road Woburn Industrial Estate Kempston Bedford MK42 7PN Tel 0234 843388 Fax 0234 840234



***Imagine* is an extremely powerful package, which allows numerous effects to be created.**

continued from page 16

EASE OF USE

Imagine is not the easiest of programs to use, but it is actually simpler than it first appears. Once you've followed the tutorials in the handbooks you can easily render up some objects and create animations, but unlike some other programs you can't just boot it up and work out what you have to do by looking at the various screens. And that's the other thing, there are an amazing number of screens in the program, and this can be a bit bewildering at first. *Imagine* is simply one of those programs where you have to read the manual. Suspend your need for instant gratification, plod through the tutorials and you'll be an expert in no time.

As far as instant gratification goes, *Real 3D* is top of the heap. It's blindingly obvious at any one point in time what you have to do, and there are only three screens to contend with: the modeller, the renderer and the wire frame window. You can, and I did, just open the program, create a few primitives and render them without the slightest knowledge of the program. Indeed, it's so easy to use that I rarely consult the manual at all, except to clarify the fine details of a control or menu that I've been playing by ear since I got the program. Intuitive is the word for it, and this means that if you've used an Amiga program before, using *Real 3D* is second nature.

3D Professional only really has one screen to speak of, but other windows are opened over the top of the main screen when you want to use greater resolutions than the plain 8- or 16-colour medium-res control screen. It's hard to see what's going on for much of the time, as the program seems to 'lock up' for great periods of time without giving the user any feedback as the what's happening. And unless you've read the manual you wouldn't have the slightest idea what any of the myriad tiny buttons and icons actually do on the toolbox window. So, intuitive? Not so, I'd say.

Draw 4D is another case of the ever-circling miniature incomprehensible icons, with no real sense of what you are actually doing at any one time. You could say that a manual is essential for understanding a program as complex as a 3D program, but I would say that in most cases I'd back a program you can understand just by looking at it against a complex mess any day.

CHECKOUT EASE OF USE

Imagine	●●●●○
Real 3D	●●●●●
3D Professional	●●●○○
Draw 4D	●●●○○

ANIMATION

In *Imagine*, animations can be rendered either to an ANIM file, to a proprietary *Imagine* animation file, or to separate IFF or RGBN files. And the animation is done automatically from the program. In the past, some programs required you to set up a scene, render it for six hours, move the objects or lights, render it for six hours... and so on for the rest of your waking life. Now you can set the thing in motion and go away. The animation is governed very professionally by paths, and the objects, cameras and lights will follow these 3D paths through space when you tell them to go, and take the amount of time you want them to take to get there.

Real 3D is another path-based program, but it is much easier to use and readily assimilable than the *Imagine* method. This illustrates sharply the difference in approach taken by the two programs – it's like the difference between a CAD program and a cel animation program. If you're a cartoonist you might not have a really sharp idea about what it is you want, but you'd like to try a few things first. If you're an industrial designer you have a plan, and you want to render as accurate a shape as you can from your precise specification. *Real 3D* lets you cartoon around before you end up with your final image, and although *Imagine* has improved in this respect, it's still far from being as easy to twiddle with as a *Real 3D* image. *Real 3D* doesn't have much in the way of wire frame previews, but there you go – you can't have everything.

Like most of *3D Professional*'s features, animation is feature-packed on paper, but in use is very clunky and difficult to get the most from. You can set up scripts to create animations, and you can use and create ANIM-format animations, but I wouldn't like to spend my life doing it. Although, having said that, the way that the program uses key frames to set up the start and end of an animation, and then 'tweens between the two, is quite good (although a little slow). Nice wire frame previews too, but this is done better in *Imagine*.

Draw 4D has appallingly slow animation creation; on the other hand, animation isn't really supposed to be the program's forté. But then again, I'm not actually sure, even after using the program to make things, exactly what *Draw 4D*'s forté is! It produces very nice *ProDraw*-format clips for you to paste into *ProPage*, but apart from that the facilities are mixed. *Draw 4D* is placed at a very odd point in the 3D world, part way between DTP, ANIM and video, doing none of the jobs really very well, apart from the DTP application. And although the new 'Pro' version, yet to be released when I wrote this piece, features much faster performance, you need a much faster performance machine to run it on anyway, so this becomes somewhat irrelevant.

CHECKOUT ANIMATION

Imagine	●●●●●
Real 3D	●●●●●
3D Professional	●●●●○
Draw 4D	●●○○○



***Real 3D* is a "blindingly obvious" program to use; its powerful commands allow the creation of exceptionally impressive graphics such as this one.**

MODELLER

Imagine has a superb and fully-featured modeller, and one which wouldn't be out of place on any high-end dedicated graphics machine, although it can be slow at times. The windows can be seen all at once, or can be switched to show a single view at a single keystroke. Although the redrawing of wire-frame and shaded views tend to slow it down a bit, these can be turned off (or at least the effect minimised), to allow you to really whip along.

Most of the time all three of *Real 3D*'s views are on screen at once. But they can be made to enlarge so they overlap, and each frame can be called up just by clicking on it. Redraws are fast, and all the objects are usually displayed in different colours, so you can really see where one ends and another begins. Setting the camera viewpoint is the simplest of all, as you just zoom the camera around on the wire-frame view, click on a button like taking a snapshot, and there it is. It's more like composing a picture in a viewfinder than cooly deciding where you are going to position the camera from looking at a plan of the area.

3D Professional allows you to decide between a four screen all-at-once view or a single view, but as far as I can see you are limited to the same size of view for each. The redraw is so slow as to be completely unusable. If you find yourself in a resolution mode which you don't want it's quicker to reboot and start again.

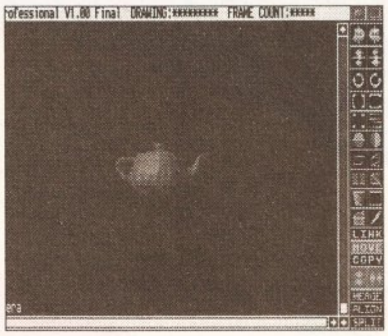
Draw 4D's modeller is bizarre, and I found that most of my time was spent watching the object spinning around stupidly in the middle of the screen. This gives you a very keen idea of what the object looks like from all around it, but is no good if you can't stop it from spinning without accidentally starting some other process going instead. I hope this is all fixed in the new version.

RENDERING

Imagine allows you to create beautiful images with the minimum of effort – and they render very fast by post-*Sculpt* standards. Control over transparency, colour, texture, shading, specularity and lighting is both subtle and powerful; the control is limited only by your knowledge of the program and its menus – hence the attention you should pay to the manual before you start.

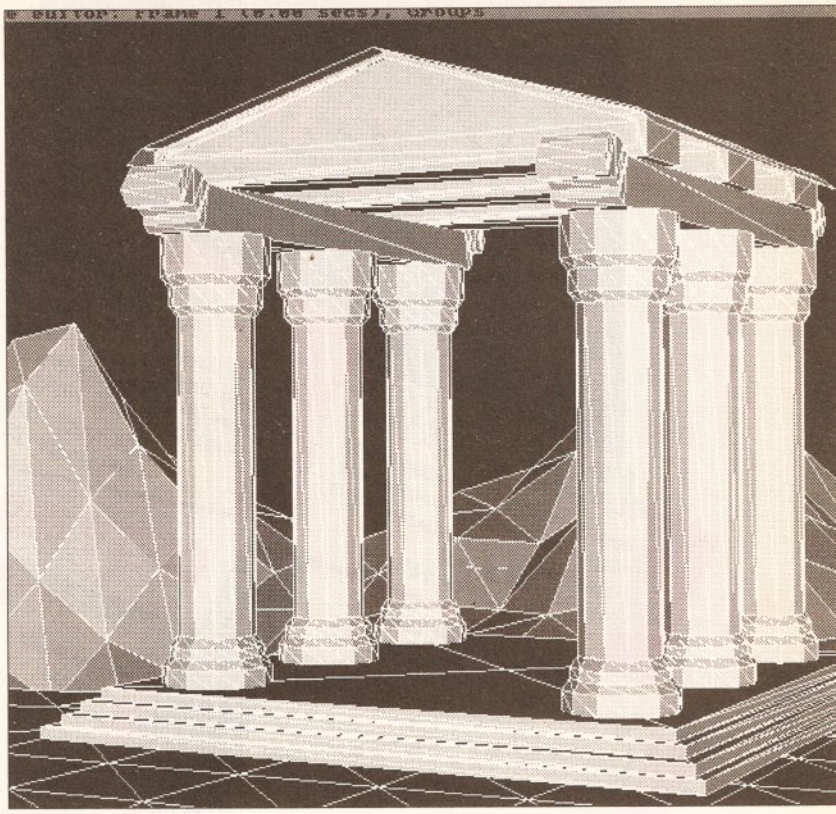
Real 3D is a piece of cake all round, with some very powerful and striking effects achievable very simply. Like all things to do with this package you can work out what you have to do simply by looking at the screen, and only the more subtle effects require you to examine the fine print in the manual.

3D Professional isn't a ray-tracer, which makes you wonder why it is always pitched against *Imagine* and *Sculpt* as a genuine 3D modelling engine. It is, in a real sense, a modeller not a renderer, although a proper rendering module is supposedly in the works as we speak. But having separate modules to cope with such integrated tasks as modelling and tracing is foolish in the extreme. And as the thing is likely to cost about $500 anyway, it's a wonder anyone bothers with it at all, in my view.



An object in *3D Professional*.

Draw 4D is very poor, although I have seen some screenshots which do give a different impression. How you'd get such subtle mapping and rendering in this program, and indeed how many years you'd have to wait to get them there, I don't like to say, though. The use of this program as a renderer is limited by your machine's RAM, as the program's memory management is very poor – it seemingly allocates bottomless chunks of memory for no real purpose.


This is an image which is in the process of being created in *Imagine*, using the wire-frame view.

DOCUMENTATION

Imagine has terrific documentation. Two booklets take you through a bunch of tutorials and reference material respectively, with the barest minimum of flourish and fluff. I'd have preferred the books to be spiral bound, as you can't leave them open at the page you are referring to at any point, being rather thick and stiff, but they are lucidly and carefully written to help you get the best out of the program. Tech support is available in the UK from the vendor, Alternative Image, so you have got someone to call to get you past the trouble spots. Alternative Image also supplies *The Imagine Companion* book and the *Imagine Tutorial Video*, both of which are companion works to the *Imagine* manual.

Real 3D has a nicely presented – if somewhat garish – manual, with a supplement which details the new features in version 1.3. It's spiral bound, which is my preference for reference books. Although flexible of cover, the books are a little stiff in the translation from Scandinavian, so they suffer from not being very clear about what they are talking about once in a while. However, they're generally pretty good taken as a whole, and contain lots of pictures and diagrams to help you through the tricky bits. Once again, tech support comes in the form of UK-based Alternative Image, so a friendly word on the phone is all it takes to get you past any snags.

3D Professional's packaging is filled with docs and disks when you open it, giving you the impression that you've really got value for your money. But although the documentation is very well produced and written, it's just padding to add to the value. You can find out what you need to know about the program, sure enough, but the program fights back so much it's hard to keep your interest up. And if something goes amiss, there isn't any way you can talk back to the book, which you do feel the need for sometimes. Tech support is based in the USA, so no help is there when you need it. And although there is a video in the pack if you buy direct from the USA, it's useless as it's in NTSC format.

Draw 4D comes with a thin booklet which describes the use of the menus and the features, and also a bit on the philosophy behind the program which, although very worthy I'm sure, didn't convince me that this was a product worth buying over, say, *Real 3D*.

continued on page 21

CHECKOUT MODELLER

Imagine	●●●●●
Real 3D	●●●●●
3D Professional	●●●○○
Draw 4D	●●●○○

CHECKOUT RENDERING

Imagine	●●●●●
Real 3D	●●●●●
3D Professional	●●●○○
Draw 4D	●●●○○

CHECKOUT DOCUMENTATION

Imagine	●●●●●
Real 3D	●●●●●
3D Professional	●●●○○
Draw 4D	●●○○○

MicroMAIL

Unit 9, Smug Oak Business Centre
Lye Lane, Bricket Wood, St Albans, AL2 3UG
Tel: (0923) 894111 - 8 Lines
Fax: (0923) 894143

DEAL OF THE MONTH
NEW Star XB24-200
Pro-To-Col Series
1 Year Free Onsite Maintenance
£369 inc VAT

AMIGA 500 GRAND PACK
FULL SCREEN GEMS PLUS:

10 Hit Games, 20 PD Power Pack, Word Processor, Spread Sheet, Date Base, Accounts, Virus Killer, Games, Demos, 10 Blank Disks, 80 Capacity Data File Disk Box, Dust Cover, Mouse Mat, Quickshot Joystick.

512K Amiga £369 inc VAT
1 MB Amiga £389 inc VAT

AMIGA 500 SCREEN GEMS
Includes full Amiga Pack plus

- Shadow of the Beast II
- Days of Thunder
- Back to the Future
- Night Breed
- Deluxe Paint II
- Virus Killer Disk

512k Amiga £329 inc VAT
1 MB Amiga £349 inc VAT

AMIGA 500 "CARTOON CLASSICS" GAMES PACK

Includes: 1Mb memory "The Simpsons", "Captain Planet and the Planeteers" and "Lemmings" games, plus Deluxe Paint III, plus Quickshot Joystick.

£349 inc VAT

CD TV £599 inc VAT

PRINTERS

HP DeskJet 500	363 inc VAT
HP PaintJet	763 inc VAT
HP LaserJet IIIP	798 inc VAT
HP LaserJet III	1244 inc VAT
Canon BJ 10E	269 inc VAT
Citizen Swift 9 Pin Colour with lead	190 inc VAT
Citizen Swift 24 Pin Colour with lead	275 inc VAT
Star LC200 Colour with leads	195 inc VAT
Star LC24 200 Colour with lead	275 inc VAT
Star LC20 with lead	159 inc VAT
Star ZA200 with lead	289 inc VAT
Star FR10 with lead	220 inc VAT

CLASS OF THE 90'S
AMIGA 500 PLUS

A501 512K RAM Expansion, Midi Interface, Deluxe Paint II, Superbase Personal, Maxiplan 500 Publishers Choice, Dr T's Midi Recording Studio, Logo, BBC Emulator, 5 BBC Programmes, 10 Blank Disk, Mouse Mat, Disk Wallet Quickshot Joystick Plus 20 PD Educational Disk

£479 inc VAT

BASIC AMIGA 500
TO GET YOU STARTED INCLUDES:

Mouse, PSU,512K RAM, 1 MB Disk Drive, 4096 Colours, 20 PD Disk Power Pack includes, Word Processor, Spread Sheet, Data Base, Virus Killer, Demo Games, T V Modulator, Three Manuals, Built in Speech Synthesis, Quickshot Joystick, Mouse Mat

ALL FOR JUST
512K Amiga £299 inc VAT
1MB Amiga £329 inc VAT

AMIGA 500 FIRST STEPS
EDUCATION PLUS PACK

A501 512K RAM Expansion, Lets Spell At Home, Prowrite, WP, Infofile Spreadsheet, Deluxe Paint II, Deluxe Print, Music Mouse, Logo, Talking Turtle, BBC Emulator, 5 BBC Programmes, 10 Blank Disks, Do's and Don'ts Poster, Resource, In Pack Video, NAPE Booklet, Python Digital Joystick, Plus 20 PD Educational Games

£469 inc VAT

Commodore 1084S Monitor with leads	£219 inc VAT
Phillips 8833 Mark II with leads	£229 inc VAT
Zydek External Disk Drive	£55 inc VAT
Cumana External Disk Drive	£69 inc VAT
A590 Hard Drive	£265 inc VAT
A590 Hard Drive + 2 MB RAM	£325 inc VAT
KCS 500 Power Board inc 512K exp, MS DOS, Shell, 640K	£215 inc VAT
CBM A501 512 RAM Expansion	£39 inc VAT
512K RAM Expansion	£29 inc VAT
2 Mb RAM Expansion for A590	£69.00 inc VAT
10 Blank Disks	£5.99 inc VAT
50 Blank Disks	£15.99 inc VAT

AMIGA 1500

Twin Floppy 1 MB RAM, Mouse, 1084S Monitor with the Work Platinum Database, WP, Spreadsheet, Deluxe Paint III, Simcity, Populous, Their Finest Hour, Battlechess

£859 inc VAT
with TV Modulator, no Monitor **£649 inc VAT**

ORDERING

TELESALES NO: (0923) 894111

Government and School Orders Welcome.

Next day delivery for credit card orders placed before 4.00pm subject to availability Alternatively send cheque, postal order to **Micromail Ltd, Unit 9, Smug Oak Centre, Lye Lane, Bricketwood, St. Albans, AL2 3UG.** Please allow 5 working days for cheque clearance. Subject to availability, despatch is normally within 24 hours of receipt of cleared payment.

DELIVERY CHARGES: UK Mainland (not Highlands)

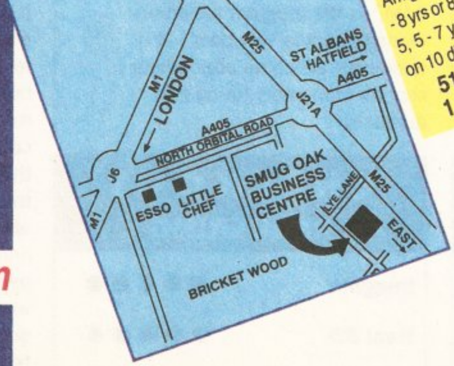
Small consumables & software items	Despatched by post, please check charges when ordering
Other Items except lasers	Next day courier service, £10 per box
Laser printers	Next day courier service, £17.50
Offshore and Highlands	Normal rate plus £20 + VAT per box

In addition we offer the following express services:

Saturday deliveries	Normal rate plus £10 + VAT surcharge per box
7am - 9am next day	Normal rate plus £10 + VAT surcharge per box
Am next day	Normal rate plus £5 + VAT surcharge per box

Prices are subject to change without notice E. & O.E.

WHERE TO FIND US



AMIGA 4 - 9 yrs BEGINNERS PACK

Amiga 500, Funschool 2 (Specify under 6, 6 - 8 yrs or 8 +) and Funschool 3 (Specify under 5, 5 - 7 yrs or 7 +), Best Educational Games on 10 disks, Quickshot Joystick

512K Amiga £359 inc VAT
1 MB Amiga £379 inc VAT

Callers Welcome at our Showroom

open 9-5.30 Monday - Saturday
open 10-4 Sunday

AMPLE FREE PARKING

JARGON BUSTING

24-bit – 2 to the power 24 bits, ie 16,777,216 bits. So a 24-bit colour system will give you over 16 million different colours to play with.

ANIM – The IFF animation format.

Brush – A clipped area of an IFF graphic created in *Deluxe Paint* or a similar Amiga graphics package.

Bump mapping – The process by which you can apply a realistic bumpy surface to an object.

Camera – The viewpoint of the observer in a 3D scene.

Chip RAM – The base level memory supplied with the machine, which the Amiga uses for graphics. See also Fast RAM.

Cycling – A process used by certain graphics packages where the colours in the palette are continuously changed during a drawing operation.

Face – A usually flat area on the side of an object: a plane of the surface.

Fast RAM – Any extra memory which is not Chip RAM.

Framestore – Digital storage capable of storing a complete frame of video. Used in digital effects generators.

Genlock – A way of linking one video source (the Amiga, for example) to another (like video tape) in order to synchronise their signals together to allow effects including overlay (key) between the two sources.

HAM – Hold And Modify is an Amiga graphics mode allowing all 4,096 colours to be displayed at once, with certain restrictions.

IFF – Interchange File Format is a means by which data from different graphics or sound sampling programs can be saved in a compatible way.

Mapping – The process of contouring a picture or texture around an object's surface.

Mix – The process whereby one image is gradually faded up across another which is fading down. Also referred to as a 'Dissolve'.

NTSC – Stands for National Television Standards Committee. This is the name for the TV colour coding system used in the USA and some other countries. It has 525 lines, running at 60 fields and 30 frames per second. It is often, and perhaps unfairly, japed at as Never Twice the Same Colour by PAL (*qv*) standard users.

Object – A 3D shape.

PAL – The other main TV colour coding system (with the exception of France's SECAM system), which is in use around the world and was developed in Britain. PAL refers to Phase Alternate Line. In fact, there are several hybrid PAL systems in use, all of which are slightly different.

Point – A face is bounded by lines, and each line has a point at either end.

RGB – Red, Green and Blue components of a video signal.

Time base corrector, or TBC – An electronic device for correcting any timing errors in the video signal produced by a video tape recorder so that it can be used by a video switcher.

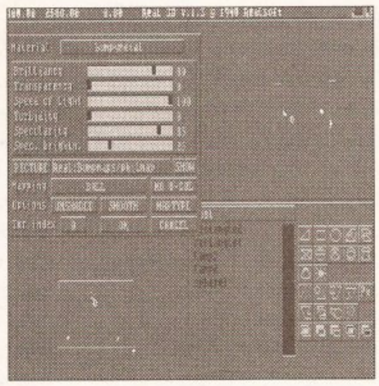
Wipe – This describes a visual transition between two images, where the edge of one progressively obscures or reveals the other.

continued from page 19

TOOLS

Imagine has an almost bewildering range of tools for the extrusion, stretching and shaping of shapes. Although less of a 'what if' program than *Real 3D*, there are still some effects which you can't get in any other program before or since.

Real 3D's tools are simple to use, and although there aren't many on view as buttons to press there are more on the menus, and once you've delved into the program a bit you notice more and more of them. The whole of *Real 3D* is designed like this, so you can start simply and learn as you go. Check the manual when you hit a snag or don't know how to do something and there will probably be a tool to do it somewhere. Once you've familiarised yourself with the basics you can go on to the more complex stuff later.



***Real 3D*'s tools are simple to use, and provide some powerful effects.**

3D Professional requires you to specify the precise number of vertices, points and so on that you plan to use before you begin a shape, and frankly this is a very nearly unworkable solution to the problem of creating objects from scratch. Although there are a lot of tools, they are crammed on the screen rather, so like *Draw 4D* (see below) you have to be very careful you don't click on the wrong one. It sounds silly, but it has happened to me numerous times.

Draw 4D has lots of tools, but they all seem to be delayed in their application – so you are generally unsure if the tool you just clicked is actually doing anything. From this point of view the program is confusing to use, and the tools are rather cluttered around the screen, as if the designers couldn't decide which would be the most frequently used.

CHECKOUT TOOLS

Imagine	●●●●○
Real 3D	●●●●●
3D Professional	●●●○○
Draw 4D	●●●○○

24-BIT

Imagine has perfect high-quality support for the Firecracker board, which should be out 'real soon now'. The program mates up with it and provides you with superb professional-quality output in either HAM, IFF 24-bit or Impulse's own RGBN format.

Real 3D allows on-line support for the ACS Harlequin card, which actually appears on the menu. Just click on that, and your Amiga sends the image to the 24-bit card right away instead of just to the screen. Then you can save it out to disk – a hard disk, since most 24-bit pics will be over 1Mb in size!

3D Professional is only really 24-bit compatible after you've rendered the pictures in another program and sent them to a frame store of some kind. No on-line 'whiz, bang, there it is' support.

Draw 4D has no 24-bit support as yet, although the 'Pro' version will have it. Actually, it's a good job this version doesn't support 24-bit, as the pictures look bad on a normal display. Goodness knows what horrors 24-bit clarity would bring!

CHECKOUT 24-BIT

Imagine	●●●●○
Real 3D	●●●●○
3D Professional	●●○○○
Draw 4D	○○○○○

PRICE VALUE

Imagine weighs in at £223.25, which means that it is excellent value for money – provided that you are willing to put the time in to learn how to use it properly. Busy people may like to fork out the extra money for the convenience of using *Real 3D* Pro.

There are two versions of the *Real 3D* program, Beginners and Pro/Turbo. The small version lacks some of the features, and comes in at £142; and the larger Pro version reviewed (also available in an '030 Turbo version) costs £409. This is a stiff wedge of money for one program – more than the computer in most

continued on page 22

continued from page 21

OTHER ALTERNATIVES

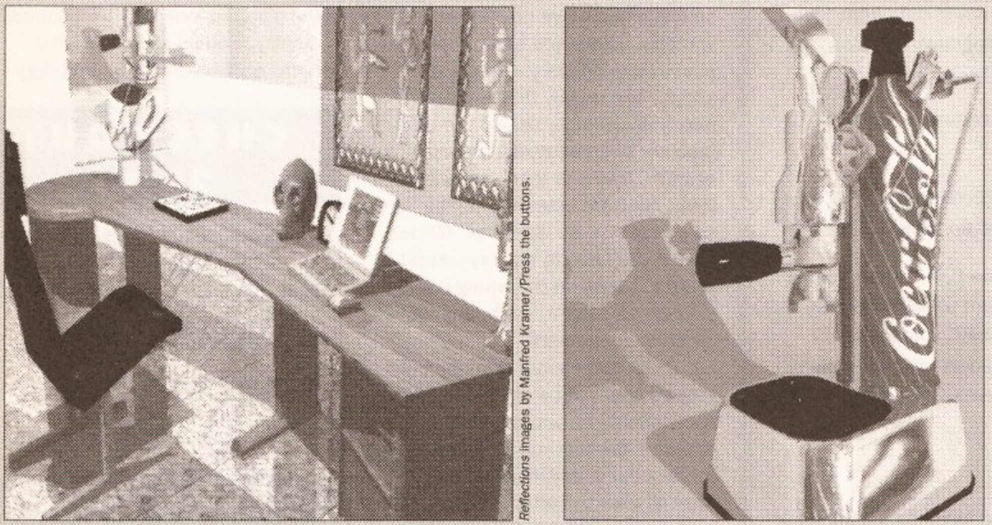
Some of the programs I thought of including in this roundup are either too old or not available yet in the UK. The following is a list of the other programs available, and a short discussion of why they weren't incuded in the main roundup.

• Sculpt Animate 4D (Byte By Byte)

As I said at the beginning, *Sculpt* was the very first Amiga 3D program, and although this version is ultra-professional it is too expensive and slow to compete against the likes of *Real 3D*. When I say rendering times are slow, I mean it. I once rendered a scene for three days solid before I aborted it, due to the fact that the thing had only got down to the 75th or 76th scan line on the screen by that time! Not really a professional tool, unless you like wrestling with your software, or you own NASA's computing facility.

• Reflections (Markt & Technik)

A German product which, although having excellent features, is not out yet in the UK. Gary Whiteley already has a copy of the German version, and will be looking at it in depth at some stage, as he's had a lot of contact with the producers of the program. This is the program that Tobias Richter uses to produce those wonderful *Star Trek* animations that he does. The mapping and shading of objects is really excellent, and it remains to be seen what price and level the program will be at when it reaches these shores. Whatever the price (and it's extremely cheap in Germany) it'll be very much worth it.



Reflections **has had superb advance word-of-mouth from Germany.**

• Turbo Silver (Impulse)

The old program by the makers of *Imagine*. The program was good, but hard to use. *Imagine* fixes all the things that were wrong with *Turbo Silver*, and adds things that *Turbo* never even thought of.

• Painter 3D (Adept)

Another German product whose fate in the UK has yet to be decided, although my guess would be that HB Marketing may well pick it up. It's a very odd program though, and has more in common with *3D Professional* and *Draw 4D* than *Reflections* or *Real 3D*.

• Tracer (PD)

A very hard to use and limited PD effort, but with strangely sophisticated features – like the ability to map an IFF brush over the objects or surface. If you want to really get to grips with numbers and stuff like that, then reach for Fred Fish disk number 66.

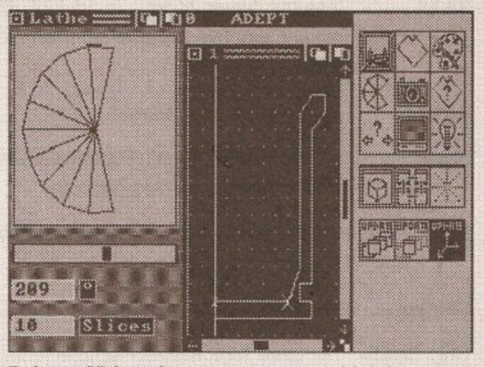
• Videoscape 3D (Oxxi Aegis)

Another oldie, and some would say goodie. I never really got on with it myself, to tell you the truth, although some folks (Gary Whiteley for example) have become real experts. The basic problem was that you had to supply the thing with a list of numbers describing your object, which you had to work out on paper. It was all too tedious, until object file transfers became possible with the likes of *Interchange*. Then objects could be created using the brilliant editor of one program, and rendered and animated using the rendering part of another program.

• Caligari (Octree Software)

Both a new and current product and yet an old product at the same time. The professional version of the program costs thousands of dollars, and the home user version is so cut down as to be useless. But there are good things about this program, like its excellent interface and its fast rendering. It's not a ray-tracer in any form, but it does perform light-source shading to a number of resolutions. Basically it's a good program, but one which has been in development for so long that it's hard to see how it can incorporate all the latest features the others now have.

The first magazine on the Amiga I ever bought in 1987 had a feature on this "great new" program. I didn't even see a demo version of it until the year before last. I understand that the manufacturer is sorting out some new distribution in the UK now, as it has been a little hard to find lately, so when that's sorted out I should be able to have a look at it for you.



Painter 3D **is a German program, which has yet to find a UK distribution channel.**

• Lightwave (NewTek)

The ongoing Video Toaster story is still ongoing, so I won't bore you by re-iterating what I've said before. OK I will, *Lightwave* (the Video Toaster's 3D software) is very impressive indeed, but although it's an excellent modeller and renderer, beating the pants off many of the programs reviewed here, it's not yet available in the UK so there not much point in looking at it in a buyer's guide. However, when it does come out over here, watch this space, as we'll be the first to see it. Check out the European exclusive review of the NTSC-version Video Toaster that Gary Whiteley and I did last issue for taste of thing to come.

• Pixel 3D (Axiom Software)

This program takes an IFF file and turn in into an extruded 3D object, which is not as stupid as it sounds. If you have a shape you want to render, just draw it in *Deluxe Paint* or something similar and run it through this excellent program. Very useful for turning IFFs into 3D objects, which is even more weird than it sounds!

• Interchange (Syndesis)

This takes a solid object from one 3D program file format and turns it into another format, so that it can be loaded and rendered in a different program. So you could, for example, create pieces using the modeller from *Sculpt* and use them in *Videoscape 3D*. *Interchange* is a very sensible addition to any 3D system, as most 3D programs read more than one format.

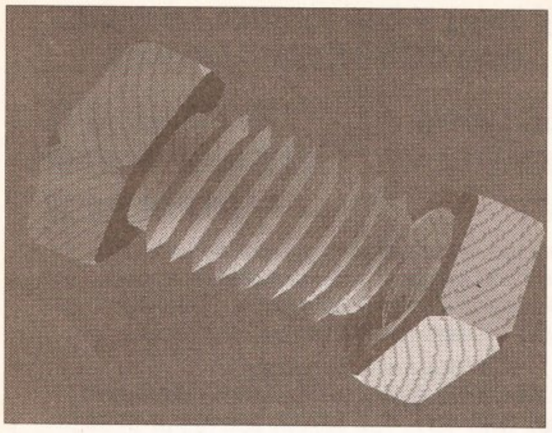
• AMOS 3D (Europress Software)

A vector graphics module for the AMOS Basic program, reviewed in this issue's AMOS column.

• 3D Construction Kit (Domark Incentive)

This is an interactive version of the *Freescape* system, from Incentive, which allows you to make your own 3D games or simple shaded environments. Easy to use but not very realistic.

continued on page 24



Draw 4D: "nice enough, but too slow for serious purposes."

continued from page 22

cases, in fact, but it is worth it for the clean simplicity of the product. Obviously as part of a professional setup, the price is negligible compared to the rest of the equipment.

3D Professional's US price of around $500 has shrivelled over here recently to £260.83 (+ VAT) in the light of better and cheaper programs like *Imagine*.

Draw 4D costs a middling £149.95. As an add-on to a DTP setup it is worth a look, but as a 3D program at this price I'd consider hard if it's really going to do the job. Which to my mind it doesn't – especially for video and animation.

CHECKOUT
PRICE VALUE

Imagine	●●●●○
Real 3D	●●●●○
3D Professional	●●●○○
Draw 4D	●●●○○

OVERALL

Overall, *Imagine* is the most professional of the programs tested, and leads the field in this country for high quality 3D rendering and animation. In concert with the own-brand Firecracker 24-bit board it forms the basis of a professional 3D system which has few competitors, with the exception of the yet to be released UK-format NewTek Video Toaster. The Toaster is very good, but until that hits these shores, you are best off hitting the metal, chrome and glass with *Imagine*.

Support for *Real 3D* is very high, and both the writers and the distributors in the UK are very keen to show everyone concerned with the buying and selling of this program that it is a simple and powerful piece of software. This is the one program I tried that was almost all things to all men, lacking the essential subtlety of *Imagine*, but having enough power all the way up to 24-bit to keep you with it for long time to come, from beginner to professional animator.

3D Professional is an expensive and slightly old -fashioned program, having more in common with programs like *Videoscape 3D* (and coming from a similar era too, I seem to recall) than the more modern programs with more features and true ray tracing. Version 2 is out in a couple of weeks, and from the sound of it this will bring *3D Professional* into the eighties. Unfortunately this is 1991, so that's a bit of a shame.

Draw 4D is a very confused and confusing program, which never appears to know quite where it is or what it's supposed to be doing with itself. The Pro version is out very soon, which will bring 24-bit capability and is reputed to be a lot faster off the mark. It also appears, from what I've seen of it, to be a more focussed program, which knows a little more about the market, and what it is exactly that it is trying to do.

CHECKOUT
OVERALL RATING

Imagine	●●●●○
Real 3D	●●●●○
3D Professional	●●●○○
Draw 4D	●●●○○

SUMMING UP

From the programs on offer, the best are *Real 3D* and *Imagine*, and although these programs are similar in price one is more of a commitment than the other. *Real 3D* is a breeze to use and learn, while *Imagine* is somewhat more tricky to get the hang of. *Real 3D* has some good features, Imagine has some great features. It's a trade-off; sometimes you need a little 3D, sometimes you need a lot. *Imagine* has a lot.

3D Professional and *Draw 4D* are nice enough, but too slow for serious purposes and a little too low-grade and inflexible for really artistic rendering. I'm sure that some would disagree with me, but there you have it. My opinion is based on long hours sat at the computer, or rather not at the computer but pacing up and down waiting for things to render. The key word here is fast. The faster a program is, the happier I am – especially when I'm testing a huge number of them! So, having tried just about every other one there is over the years, *Real 3D* or *Imagine* are the ones to go for, in my opinion.

My ideal setup would therefore comprise *Imagine*, a Firecracker 24 board, Simpatica and a huge bank of video effects, but if I have to I'll settle for *Real 3D* rendering to a Harlequin. If I wanted to keep costs down, I'd send 24-bit files to my HAM-E board. AS

SHOPPING LIST

Draw 4D £149.95

Available from Surface UK
5 Rockware Avenue
Greenford
Middlesex UB6 0AA
☎ 081-566 6677

Real 3D ....(Beginners) £142.00

Real 3D ....(Pro/Turbo) £409.00

Imagine £223.25

Available from Alternative Image
6 Lothair Road, Aylstone
Leicester LE2 7BQ
☎ 0533 440041

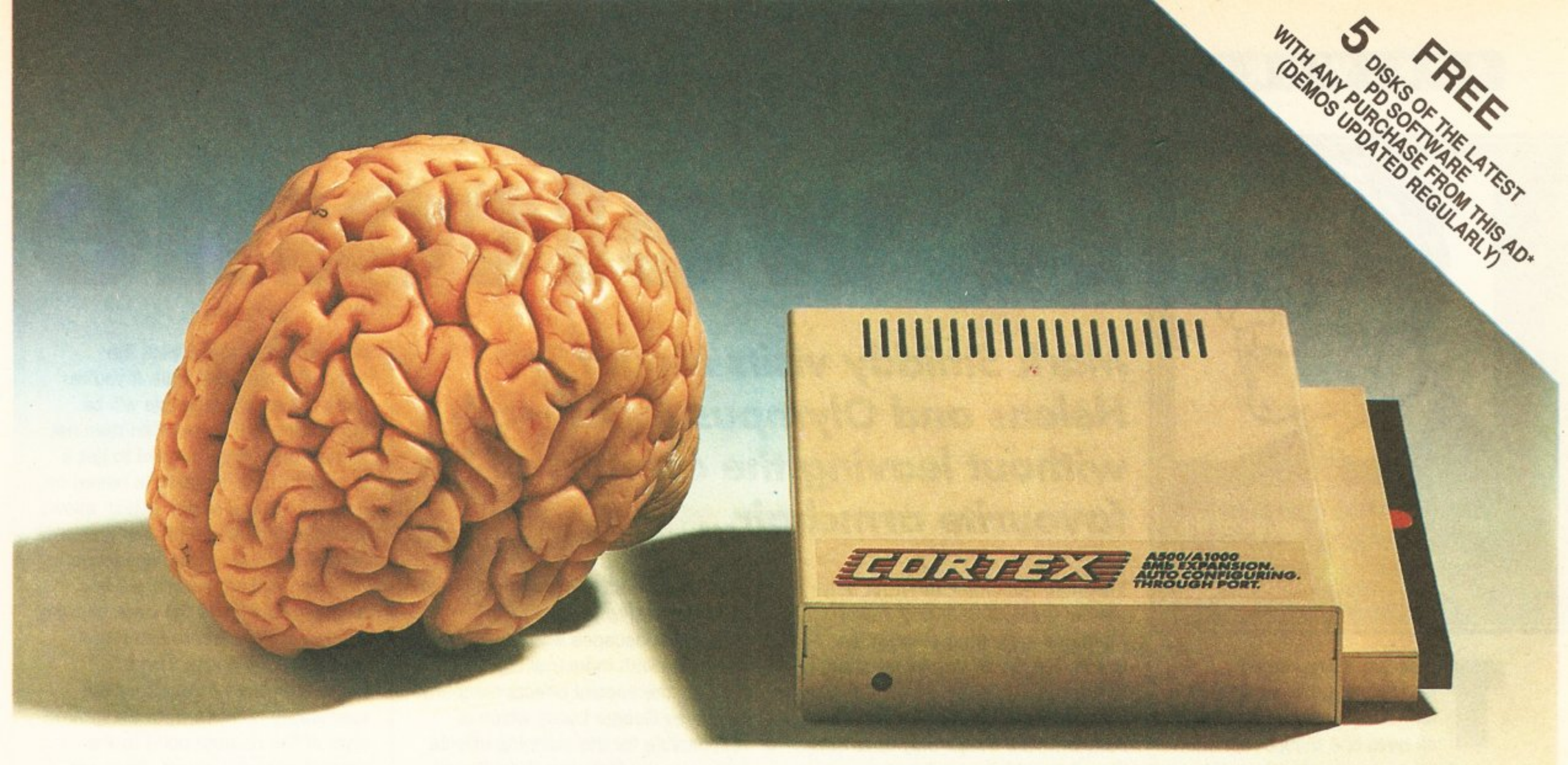
3D Professional £260.83

Available from HB Marketing
Unit 3, Poyle 14
Newlads Drive
Colnbrook
Slough SL3 0DX
☎ 0753 686000

FEATURES TABLE

	Real 3D	Imagine	3D Professional	Draw 4D
ANIM standard	Y	Y	Y	Y
1Mb needed	Y	Y	Y	N (yet)
24-bit support	Y	Y	Y	N (yet)
3D fonts	Y	N	Y	Y
030 support	Y	Y	Y	N
Anti-aliasing	Y	Y	Y	N
ARexx	N	N	N	N
Fades/Dissolves	N	N	Y	N
HAM supported	Y	Y	Y	N
Genlock support	Y	Y	Y	N
Standard Amiga fonts	N	N	Y	N
Stencil, Mask or Matte	N	Y	N	N
RIF standard	N	N	Y	N

(Note: bear in mind that the new version of *Draw 4D* will have more features)



A brain | The next best thing

CORTEX 8Mb RAM Expansion for the Commodore Amiga A500/A1000

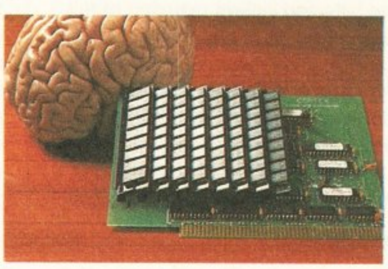
- External fitting. Warranty remains intact
- Fully implemented auto-configure
- Fully operational through-bus
- Uses standard 1M x 8 bit or 1M x 9 bit SIMMs
- Complete with its own power supply unit (UK, US or EURO)
- Designed with A1000 compatibility in mind
- Zero wait-states
- RAM test software

Commodore Approved

2Mb **£269** 4Mb **£349** 8Mb **£519**

CORTEX 8Mb RAM Expansion for the Commodore Amiga A1500/A2000

- Fully implemented auto-configure
- Zero wait-states
- Uses standard 1M x 8 or 9 bit SIMMs
- 2, 4, 6 or 8Mb configurations possible



2Mb **£199** 4Mb **£289** 6Mb **£369** 8Mb **£449**

CORTEX External 3.5″ Floppy Drive

- High-quality silent mechanism
- Enabled/disable switch
- Through port

£59

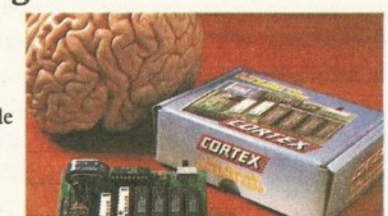
"The Cortex unit is the best that has ever passed through my hands . . . This is THE board for the A500 user who wants memory."
John Kennedy, Amiga User International, December 1990

"What a joy! This really is an expansion and a half."
Pat McDonald, Amiga Format, November 1990.

"There is nothing in the universe more annoying than the lack of a through port, except perhaps the tendancy of Volvo drivers to cut out in front of my GPz550."
Nick Veitch, Amiga Computing, December 1990

CORTEX 512K RAM Expansion for the Commodore Amiga A500

- Low power 1 Mbit RAM chips
- Enable/disable switch
- "Fatter" Angus compatible for 1Mb Chip RAM
- Available with or without battery-backed clock/calendar module **£27.95**



Clock version **£31.95**

CHIP UPGRADES

1Mb Agnus Chip 8372A - **Requires some technical skill to fit** **£60**

Kickstart ROM upgrade version 1.3 **£35**

256K x 4bit DRAM chips (for CBM A590, CBM 2091, ICD Ad RAM, Ashcom etc) **0.5Mb £25** **1Mb £49** **2Mb £95**

A3000 Static Column Mode DRAM upgrade **4Mb £269**

1M x 8 bit SIMMS for CORTEX 8Mb cards **2Mb £90** **4Mb £175** **6Mb £260**

All prices include VAT and postage & packaging.
Dealer enquiries are welcome.

CORTEX

Cortex Design Technologies Ltd., Britannia Buildings, 46 Fenwick Street, Liverpool L2 7NB, England.
U.K. Tel: (051) 236 0480 • 24 Hour Sales (051) 227 2482 • 24 Hour Fax

★ Free software is limited to one set per order and is supplied without warranty

A welcome



"Can computer simulations paint an accurate image of the real world? Let's see..."
Mark Smiddy

Mark Smiddy visits Mount St. Helens and Olympus Mons – all without leaving the comfort of his favourite armchair...

There are 3D rendering engines and there are 3D rendering engines, but they all have one thing in common – you have to create objects using skill and imagination. VistaPro is different: it provides a 3D engine specifically designed with artists and animators in mind; a system which allows real places to be explored from an almost limitless number of viewpoints. Created by John Hinkley and Brick Eksten of Hypercube, VistaPro can take anyone on a tour of the magnificent El Capitan in Yosemite National Park or for a fly-past of the 4,000km-long Valles Marineris – the equivalent of the Grand Canyon on the planet Mars.

FIRST THE GOOD NEWS...

Fans of these things may have seen the original Vista receive rave reviews already – but VistaPro is different. Vista provided stunning impressions of far-off lands, but VistaPro will do it better, faster and with more power than many ever thought possible. Better still, it can produce pictures without the nasty jagged edges which tainted the original, and display them in over 16 million colours – assuming that you have the correct hardware, of course. In fact, VistaPro is capable of drawing landscapes we tend to associate with Industrial Light and Magic – the special effects company owned by George Lucas which is responsible for the stunning effects in many sci-fi films like Total Recall.

...AND THE BAD NEWS

Well it's more of an excuse, really: VistaPro requires 3.5Mb of memory – 3Mb at a pinch; preferably 4Mb if you want to run a hard disk too. (NTSC users can get away with 512K less because their screens take up less RAM.) If you're still deciding whether to buy that extra couple of megs, beware: this review might turn out to be expensive.

VistaPro is not a 3D drawing or modeling package – it's a viewer. Now that may not sound particularly awe inspiring, but consider that the program uses real cartographical (map) data from real places and you might get some impression of what this package is all about. The best way to imagine what the package does is to get hold of a large-scale OS map – not a simple route planner, but a good quality map that shows land relief. Now imagine all the hills and valleys extruded to full size, add a bit of shading and mist haze for good measure and you see the idea. And VistaPro can show you places that you will probably never visit – Mars, for example...

Getting started with VistaPro is a cinch. Simply load in one of the pre-defined landscapes, click the 'render' button and wait. If you're lucky the resultant image will be interesting, but more often than not some work will be needed to get a decent picture. VistaPro is based on a camera-target system which allows you to set the angle of view precisely across any area of the landscape.

Landscapes themselves are displayed in simple 2D view, allowing you to set the camera and target (x,y) positions easily. The z parameter (the height above the landscape) is taken from the ground level of the nearest point to the camera or target object. Once set, fine adjustments can be made simply by entering a new value for any of the three coordinates.

VistaPro calculates the relative distance between camera and target (x,y,z) although these can be set if required. A very useful feature here is the independent coordinate lock – that is, you can lock just the z and y coordinates and move the camera or target in the x plane without affecting the other two. Unfortunately, the (x,y,z) lock is the same for both camera and target, and this can sometimes make editing difficult. For the adventurous animator, VistaPro

BLITS

VistaPro is theoretically capable of producing an animated flight down the entire 4,000km long Martian grand canyon. Moving at a leisurely 1 metre per frame and 5 frames per second it would take 9 days to play and need a 200 gigabyte hard disk!

& BOBS

BEGINNERS — BEGINNERS START HERE — BEGINNERS

What is a vista?

Chambers' dictionary defines a vista thus: A view or prospect; a mental view or vision extending far into the past or future, or any subject engaging the thoughts. From the Latin, *visum*, to see. For me, this sums up *VistaPro* the software very well indeed.

Will I need an accelerated machine?

Strictly speaking, no. However, *VistaPro* will make use of well-designed second processor cards such as 25MHz 68020s. This will reduce the rendering time – and especially the drawing time – noticeably. Nevertheless, to get the best from the software you really need a maths co-processor (typically a 68881), which will reduce the rendering time dramatically. This is because the thousands of floating point calculations required will be performed by the hardware and not by the tortuously slow software floating point libraries.

Will I need a frame buffer?

Not really. Frame buffers are the preserve of professional studios using Amigas for things like television programs. A standard Amiga using interlaced HAM provides some very acceptable results. Of course, if you have a B2000 and the necessary readies to pop out and buy one, the extra 16-odd million colours will certainly help!

Is a hard disk required?

Yes and no. Like most other optional add-ons, a hard drive will help enormously. You will need a hard disk to use the animator, because even a short animation is likely to use several megabytes of disk space. If you don't already have a hard drive and want one to use with *VistaPro*, go for the fastest one you can afford; this will effect the smoothness of the finished animation. A standard A590 will do at a pinch – see *Amiga Shopper* issue one for a complete hard disk roundup.

JARGON BUSTING

Blend – A technique for merging the sharp band where two different colours meet. Blending is fast but less accurate, and therefore less attractive, than Gouraud shading (qv).

Dither – The use of pixels of different colours positioned closely together to give the illusion of extra colours.

Gouraud shading – A form of blending colour bars to give the appearance of a smooth transition as would be found in nature.

Render – In 3D drawing packages this is the act of transforming a mathematical model into a real picture on the screen.

vista

provides facilities to edit the camera's banking angle as well as the automatic (editable) settings for pitch and heading. This facility makes possible the sort of animations popularised by the Star Wars 'Death Star' scene and the Star Trek II 'Genesis Probe fly-past'; sans firestorm, though.

On a more down-to-earth level, VistaPro comes supplied with landscaping tools to add natural features where they may not already exist. The facility to build rivers is a typical example, demonstrating that some thought has been put behind this package. Select 'river', click where you want the river to start and VistaPro follows the natural landscape contours – even forming small lakes and waterfalls where necessary! Although some of these features are difficult to imagine on the plan view they come into their own when rendered on a 16 million-colour, high-resolution interlaced screen with Gouraud shading. Interestingly enough too, the annoying flicker usually associated with interlaced screens is almost imperceptible on the high-quality renderings.

Artists will find the ability to set light and shade – and the direction of ambient light – of real benefit. Visual futurists will be enchanted by the option to set (random) stars in a night sky. This will allow them to set the sun rising behind the viewer looking over the crater lake and the cauldera area of Olympus Mons on Mars. Also included are Half Dome and El Capitan in Yosemite.

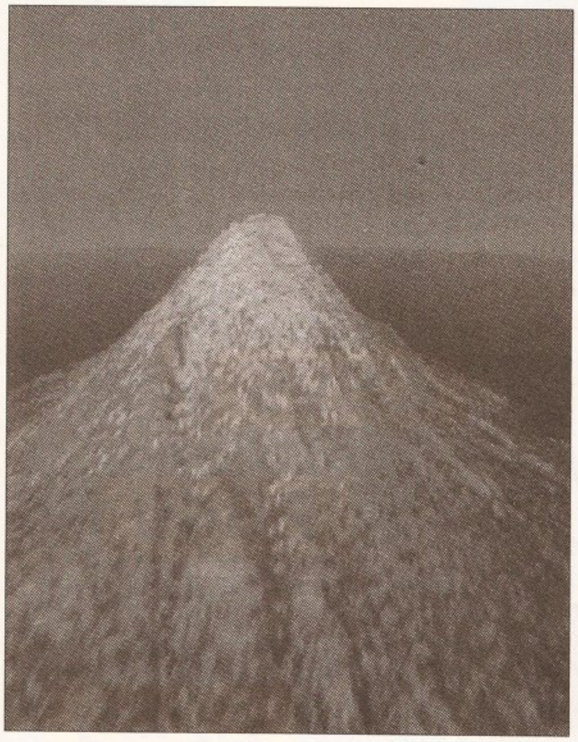
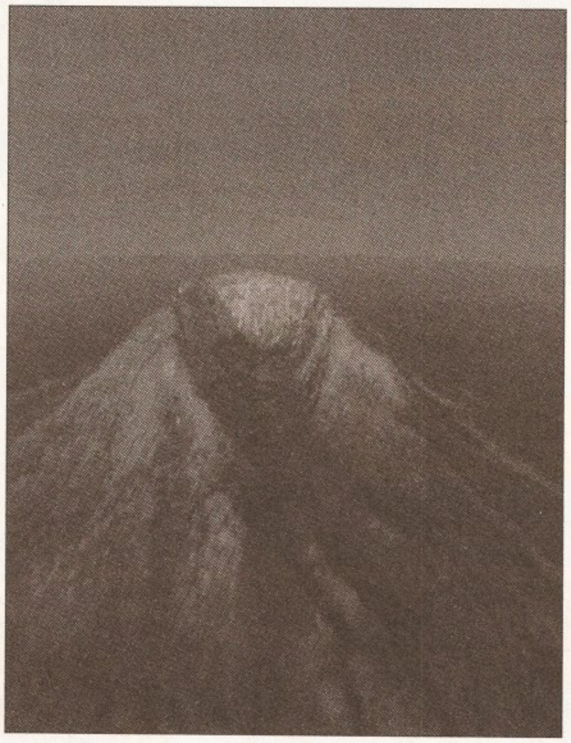
The ability to perform renderings on a variety of screen formats is a new feature of VistaPro. It supports low and high resolution, HAM, and overscan mode in any of these – so even video animators will be able to make the best use of the package. VistaPro saves its renderings in standard or 24-bit IFF, 24-RGB and Turbo Silver format. This makes it possible to display the pictures on frame buffers or use them as stills in presentations. For instance, the Mount St Helens disaster in the early 1980s is captured in all its glory both before and after the volcano blew thousands of tons of rock miles into the air. The completed stills could be used in vulcanology lectures as they stand or edited in an art package like DPaint.

So much for raving over the package. It does, however, still have a few faults. The worst of these concern the animation side of things, so if animation is not your scene these will be of no concern whatsoever. My biggest bugbear with the animation control is that it is very basic. A form of macro language is used to create the animations over a long period. You start the recorder and record the various points along the route. Once done, VistaPro performs the rendering and saves each frame without further user intervention. Hard disk users can make use of VistaPro's VANIM format since this gives the best effect. The problem is that once a point has been fixed, it stays fixed. There is no way to edit the final result. I would have preferred even a simple command line editor so that each step could be edited.

CONCLUSION

Is VistaPro worth the best part of a hundred quid? In my opinion, given its unique appeal, ease of use and the ability to produce pictures of photo-realistic quality – yes. I find it amazing that Virtual Reality Labs can afford to do it so cheaply, given the vast amount of topographical data contained in every map. VistaPro is anything but fast, but the end results more than justify the means employed to get there.

Although aimed at artists and designers, VistaPro could be put to work in a classroom where teachers can make use of its geographical accuracy to demonstrate rock formations and so on. Power uses will delight at playing with theof fractal landscapes; the rest of us will gaze in awe at the beauty of places we can barely imagine, let alone ever visit. I can do nothing but praise VistaPro; it's an innovative product that deserves a place in Amiga history. Those who find the system requirements a little awe inspiring can buy the original 1Mb Vista from the same suppliers. AS

Mount St. Helens before and after, as it were, faithfully rendered by the rather super *VistaPro*.

SHOPPING LIST

VistaPro............................£99.95
Requires 3.5Mb RAM; hard disk and fast processor recommended.

Vista..................................£59.95
Requires 1Mb RAM; fast processor recommended.

from HB Marketing Ltd
Unit 3, Poyle 14,
Newlands Drive, Colnbrook,
Slough SL3 0DX
☎ 0753 686000

Created by Virtual Reality Laboratories, Inc.
2341 Ganador Court, San Luis Obispo,
California 93401 USA
☎ 010 1 805 545 8515

Expansion disks (only available from VRL in the US at present):

Extended landscapes
(V002): $20 (12 landscapes)

Mt. Adams, Washington
(V003): $20 (12 landscapes)

Mt. Baldy, California
(V004): $30 (two disk set; 17 landscapes)

Lake Arrowhead, California
(V005): $30 (two disk set; 17 landscapes)

Mt. San Georgio, California
(V006): $30 (two disk set; 17 landscapes)

Big Sur, California
(V007): $30 (two disk set; 17 landscapes)

California Set #1
(V004/5/6 and 7): $80 (six disk set; 68 landscapes)

Valles Marineris, Mars
(V009): $80 (six disk set; 88 landscapes)

CHECKOUT VistaPro

Speed ●○○○○
If patience is truly a virtue, then this program is for the truly virtuous.

Interface ●●●●●
The 3D bas-relief buttons add a Workbench 2 look and feel.

Output ●●●●●
Beauty encompassed in the mind's eye.

Documentation ●●●○○
Nothing special – this program speaks for itself.

Price ●●●●○
£99.95 is excellent value for what is essentially a specialist product.

Overall rating ●●●●●
A real excuse to buy that 8Mb of RAM, GVP hard drive, 25MHz 68020/68881 and 24-bit frame buffer you've being promising yourself!

Control your editing

This month Gary Whiteley takes a look at the EMR Videopilot, a broadcast-quality genlock and some shareware video utilities



"The world of video on the Amiga just doesn't stand still – keeping up with all the new developments is a major task, which is why I'm here to help."
Gary Whiteley

The EMR Videopilot V320 is a video editing controller for your Amiga. While the idea of an Amiga-controlled video editing system is not new (there was the Edit Line a few years ago), it has taken some time to produce a system which is flexible enough for most domestic and semi-pro video editors to incorporate into their current hardware setup without drastic changes.

The EMR Videopilot designer, V3i (from Strasbourg, France), has come up with a novel solution to support the use of a wide range of video decks. By producing a unit capable of controlling different VCRs, the company has provided a mix 'n' match solution for those of us who would like to use as much of our current video equipment as possible while still having the flexibility to upgrade as and when we choose.

V3i has achieved this flexibility by incorporating four methods of VCR control into the V320 Videopilot. Thus, up to three VCRs controlled by infra red devices, the Sony L socket (5-pin mini-DIN or 2.5mm stereo mini-jack) or the JVC 3.5mm remote socket can all be connected to the V320 as source machines, so encompassing most of the current VHS, S-VHS and Video 8 VCRs (and in some cases camcorders). In addition, a more sophisticated BVU or U-Matic machine may be used as the recording deck, so long as it has a 33-pin parallel connector.

The Videopilot is a stand-alone control unit which connects to the VCRs and the Amiga serial port, and operates under software control. By searching out time code or tape code intervals specified via the *Edit Table* program, the source machine(s) can be told which shots to edit on to the recording VCR with an accuracy of up to ±1 frame (depending on the VCRs being used).

By having more than one source machine, it is possible to use a vision mixer in the system to perform effects as the edits happen. While Videopilot does not actually control the mixer, it can be set to provide audible cue beeps to inform you when to start the transition manually. Likewise, an audio mixer can be used to provide crossfades or other special effects.

Because of the flexibility of the Videopilot it would be foolish of me to talk about specific VCRs in my description of its functions and actions. Further information about VCR suitability can be had from EMR if you are unsure whether your VCRs will work with the machine.

SETTING UP

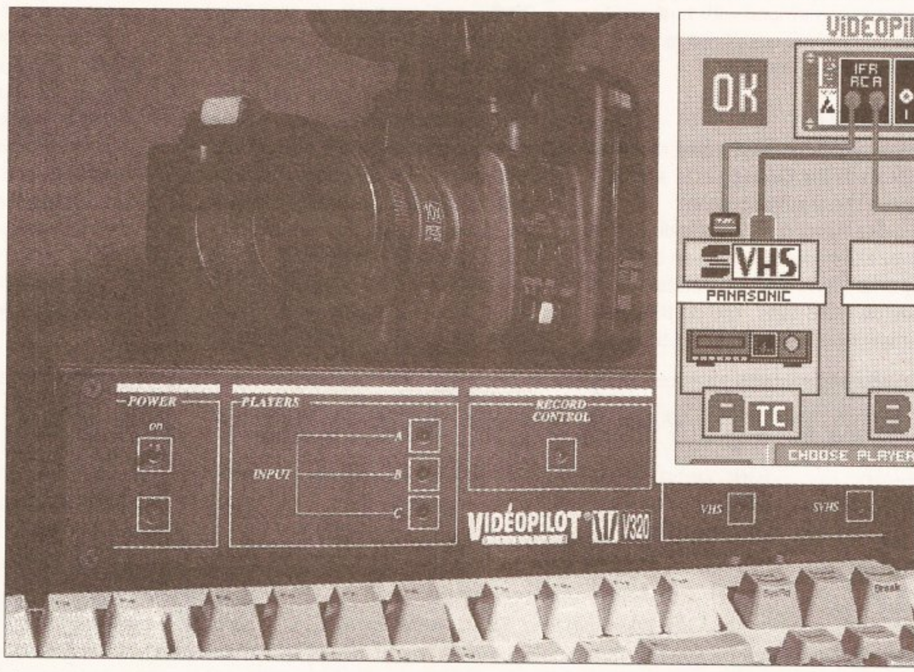
When starting up Videopilot for the first time, you must configure the system – that is, inform the software what kind of VCRs you are using and how they are connected. This is done in the Configuration screen. By selecting each input device in turn, you can run through a list of options for tape format, VCR model and time code format. You then 'connect' the VCRs to the Videopilot on-screen by clicking on the screen equivalents of the real connections already made between the various video devices and the Videopilot. If you don't quite get it right, Videopilot will inform you with a warning.

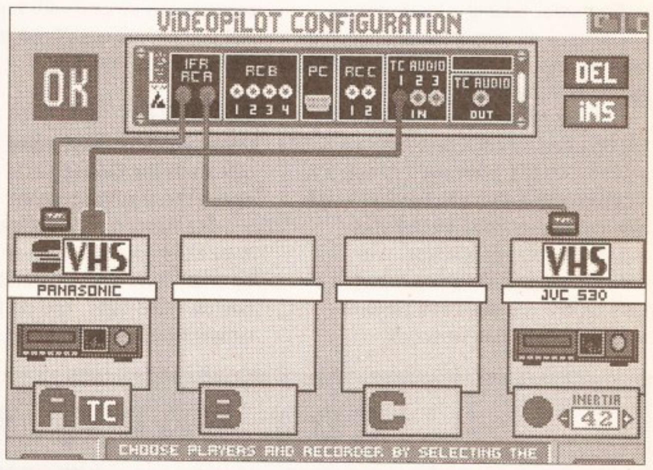
If, for any reason, you don't find your model of VCR in the preset lists, you can teach it how your infra-red controller works and then add it to the list – thus allowing other, as yet unsupported devices to be used. Doing this can be a process of trial and error, but once done the files can be saved and forgotten about.

The recorder setup also has an additional control for setting up 'inertia' – a way of fine-tuning the pre-roll of the record VCR to obtain optimum accuracy when editing. Again, setting inertia up involves some trial and error, though pre-programmed models already have their inertia set.

Once you are happy with the configuration, you have the opportunity to test the functions of your VCRs to verify that Videopilot is working as it should and controlling everything from the Amiga keyboard.

In practice, setting up is actually quite straightforward and should present no major problems.





The EMR Videopilot V320. The unit itself is housed in an attractive matt black casing; configuration is simple via the software provided.

TIME CODE

In order to get the best out of Videopilot it helps to 'stripe' an audio track on each source tape with a time code. This is easily achieved, since Videopilot puts out a time code signal (in a proprietary 'V3TC' format, which is incompatible with other time code formats). Under software control a tape can be striped while you wait, with its own identifying number. Striping can be on either channel of a stereo audio VCR or, with special modification to certain machines (including the Sony EV-1000, Panasonic FS-100 and JVC HR-D5000), as a separate track whilst retaining the original stereo sound. A PCM decoder is also

JARGON BUSTING

ASCII – American Standard Code for Information Interchange, the data storage method often used to exchange text between computers.

BNC – British Naval Connector; a type of connector commonly used for video which has a secure, bayonet lightbulb-type fitting.

CCIR – The international standards committee of the ITU (International Telecommunications Union) for radio and television broadcasting.

Component video – This is where various component parts of the video signal, such as chrominance and luminance, are kept separate from each other. This can give a better quality picture than composite video, as the components can be processed separately. An example of a component video signal is the Y/C format used in S-VHS and Hi-8.

Composite video – A video signal including chrominance (colour hue and saturation) and luminance (brightness) information in one combined signal.

EBU – European Broadcasting Union; the European equivalent of SMPTE (see below).

Genlock – A way of connecting one video source (the Amiga, for example) to another (like video tape) in order to synchronise their signals together to allow stable effects including overlay (key) between the two sources.

Luminance – The monochrome part of a video signal which carries the 'brightness' information.

Mix (also referred to as Dissolve) – A technique where one image is gradually faded up across another which is fading down at the same time, thus effecting a transition between the two.

Offline – In video terms, this can be used to refer to preparatory or rough editing using lower cost equipment than would be used in the final edit (online). Often no effects are added at this stage. Offlining is done to get the programme into shape without wasting money experimenting during the online edit.

SMPTE – Society of Motion Picture and Television Engineers; a professional organisation in the USA which sets technical standards for American broadcasting.

Time base corrector – An electronic device for correcting any timing errors in the video signal produced by a VTR so that it can be used by a video switcher.

Time code – A numerical coding system recorded on to audio or video tape to uniquely identify hours, minutes, seconds and frames to allow accurate location of the tape at any point.

VTR/VCR – Video Tape Recorder/Video Cassette Recorder.

continued from page 29

available for 8mm VCRs to enable PCM tracks to be used. For mono audio users, adding a control track will destroy all original sound, so you may be wise to make a dub copy to a stereo VCR for editing.

As the first minute of code will not be used, nor the last five minutes (that's just how it goes), it's recommended that you have at least two minutes of code before your required shots. In practice, this would mean shooting two minutes of tape before you start the serious work – no real loss when you consider the low price of tape and the advantages gained later.

It is possible to edit without using tapes striped with time code, but accuracy is sacrificed to ±6 to 10 frames if you do so.

EDITING

Once you've got everything ready you can go to the Editing Table screen – where the real fun begins!

The function of the Editing Table is to allow you to set up an edit list by entering in and out points from a source video tape. You do this quite simply by playing the video tape (using the Amiga function keys) until you get to where you want a shot to start from (with fine tuning being performed using pause, step forward and reverse if they are available on the VCR you are using) and then hitting [Return]. A numerical code (HRS:MINS:SECS:FRAMES) will be displayed showing the start of the edit point. Similarly, play the tape on until you reach the end of the shot, hit [Return] again and the cut-out point is entered. A duration will be calculated for the shot and you can enter a brief description of it if you wish (up to 35 characters). Keep repeating the process to build up a complete edit list for your project.

When you've finished you'll have a list of shots with shot number, VCR and tape number (if you've numbered them individually during time code striping), in point, out point, shot duration and a comment for each. The total number of shots is also displayed and the total length of all the shots listed. An additional column allows you to set up 'special effects' – but more on this later.

Armed with the edit list, you can now assemble the complete sequence. This is very easily done by

COR BABY, THAT'S NEARLY FREE!

Now here's something that's almost free – and that really does make a refreshing change in the world of video and Amigas!

Electriclown 14 is a disk full of shareware video tools and utilities, all of which could be useful under the right circumstances.

There's *TitleGen*, which is a simple scrolling titler; *VTOT* (Video Tools On Tap), which has a set of test patterns and other tools; *Sportstext*, a simple caption program; *VPG* (Video Pattern Generator), another set of test and alignment patterns; *sMOVIE*, which is another scrolling video titler; and finally *LogTape* – a utility for making logs of the contents of video tapes. Quite a few goodies to check out, in fact.

The disk contains documentation and demo files for each of the programs, and comes as a bootable, menu-operated package. There are no icons for starting any of the programs up on their own, but with a bit of application you can add icons from elsewhere (just make sure that they are TOOL icons), rename them and then you can run the programs from anywhere, including a hard disk. The only program I couldn't get to work like this was *VTOT*.

So, let's have a gander at what's on offer.

The two title programs, *TitleGen* and *sMOVIE*, are both really ASCII script readers – which means that you have to write your titles as a script with a text editor such as *TxEd*, *Ed*, *memacs* or whatever. By placing certain commands into the script you are able to control items such as colour, font style and size, scrolling speed and whether the text is centred or not. Although you may think that actually having to do the typing and setup yourself in a text editor is a bit of a chore, just think of it as part of the Amiga learning curve. It's actually very easy and you'll soon get the hang of it, even if you can't program your way out of a paper bag. You'll also have to learn to find your way around the machine a bit more if you wish to use other fonts with these programs. In fact you can use just about any font you like, and in any size that you can find, with both *TitleGen* and *sMOVIE*.

Of the two programs, *TitleGen* is the simplest to use, mainly because it has fewer frills. But I thought that its output was more jerky than *sMOVIE*'s, especially at higher scrolling speeds. I prefer *sMOVIE*, even though it means doing more work initially in the 'programming' of the text file and a little more thought. Its results bear the fruit of your labours, and if you want a reasonably featured scrolling titler for very little outlay then have a look at this program. It also allows you to do very simple line graphics (horizontal lines, in fact) and also manipulate the display window size to allow for effects such as shrinking or moving text boxes. Not particularly spectacular – but it may be just what you've been looking for to complete the title sequence of your latest epic production. With a little care and planning, *sMOVIE* and *TitleGen* could become treasured parts of a very low-budget video armoury.

selecting 'Assemble' from a pull-down menu, hitting the function key for Record VCR, another F-key for Pause and then [Return]. Assuming that you have enough source machines connected, the entire sequence will then be put together while you walk the dog, sleep, go to the pub or whatever else you choose to do now that you're no longer tied to the edit suite. If Videopilot requires a change of source tape it will let you know.

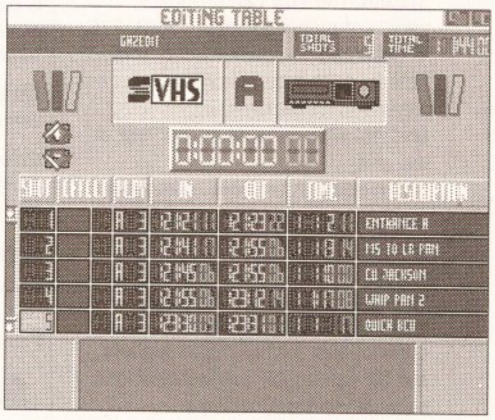
If you have a Sony V800 (Video 8 machine) it is possible to have the Videopilot do a sort of 'preview', where the listed cuts will be shown on a video monitor without being edited to tape. But this feature is actually of little use to most people and may be removed for future versions.

CHOP AND CHANGE

Now, here's where the (minor) drawbacks start. You've done your assembly and something isn't quite right. So, what to do? On a professional edit system it is often possible to correct a minor problem by 'insert editing' a new shot in the place of the existing, incorrect edit. But this just isn't possible with Videopilot. You simply have to go back and make adjustments to the edit list and assemble the whole thing again (more time to walk the dog, though!).

Making the adjustments is simple enough – just locate the problem and adjust the edit points to fit by using the mouse. Alternatively, if you want to change the shot order around, or cut one scene and insert another in its place – no problem! There are editing facilities for cut, paste, insert and delete. Blocks of shots can also be moved around, which is great if you need repetitive, 'video scratch'-type edits. But unfortunately time code numbers cannot be typed directly into the list, which is an omission since numeric entry can be quicker than running through tapes when you already have a list of shots you wish to edit.

The edit list is automatically saved to disk (by default) and can be recalled or replaced by another, previously saved list. Lists can be printed and could probably even be used to run a full, professional, editor (under the right circumstances) so that you could use Videopilot to make the 'rough cut' of a commercial, for instance, and then use the list information to help edit your original master tapes together.



The Editing Table is where you put your masterpiece together.

CUE MIXER!

Now, what about the 'special effects' mentioned above? Well actually, most of them aren't really special effects at all, but are flags which can be set to prompt you that there is a sequence of shots coming up which may require that you operate a vision mixer, caption camera or genlock to produce a desired special effect. By putting a marker in the 'Effects' column, the Amiga will give you an audio cue (a buzzer sound) to remind you to do the business. Videopilot will then wait for you to confirm that you are ready to make the effect before continuing. Other 'effects' include the ability to automatically pause a source machine to provide a still (frame, that is) of specifiable length – although of course the quality of still you get depends on the quality of the pause of your VCR.

So, what do I think? I think that the Videopilot is a jolly good idea and I wish they'd been around a long time ago. EMR makes no claims that it is for professional applications (though a professional version is in the pipeline), but for those people who have struggled with stopwatches and tape counters over the years this is certainly an editor to consider. And as it seems that many videographers already have Amigas anyway, the additional cost shouldn't be too bad. After all, good video equipment isn't cheap – so why should a good editor be? Actually, I wish everything was good *and* cheap... but there we are.

However, be warned that the software is not multitasking, so you'll have to lose a generation on your graphics (by laying them off to tape before editing) or get hold of another Amiga to either run the Videopilot or do your graphics on. By the way, Videopilot will run on any Amiga 500/1500/2000/3000 with DOS 1.3 or above and will probably work on an A1000 if the serial cable is altered (check with EMR first, though!). The software can be installed on a hard disk.

Lastly, EMR has an animation package due out soon which will control a video deck to allow two-frame edits to be made while using a video camera. A professional version of Videopilot is also on the way.

Videopilot comes supplied with cables, software and one infra-red unit. Further infra-red units are available, but you'll also need a multiplexer if you intend to control more than two infra-red sources. You'll also need a special cable if you intend using a BVU or U-Matic machine as a recorder.

continued on page 32

CHECKOUT VIDEOPILOT V320

Documentation ●●●○○
All the information you need, but makes assumptions about the user's existing computer and hardware literacy. New version due soon.

Ease Of Use ●●●●○
Easier than using a telephone (well, almost).

Hardware ●●●●○
Well built and sturdy.

Software ●●●●○
Easy to use, lots of features.

Price ●●●○○
At £850, it's like most video equipment – a little on the expensive side.

Overall rating ●●●●○

If you want a computer-controlled video editor then I'd recommend that you take a look at Videopilot.

What else is in this collection? Well, the two pattern generators – *VTOT* and *VPG*. Unfortunately both are in NTSC format, meaning that they are only of passing interest to the serious video users amongst us. My favourite of the two was *VTOT*, even though I had to boot with the Electriclown disk to get it to work.

VTOT provides various test patterns, including colour bars, grey scales and line patterns, which can be used to set up things like the colour, brightness and alignment of monitors. It also has a facility for flipping the whole screen display either horizontally or vertically and can be made to fade the current screen to or from black (at any of a range of preset speeds). All commands are via the Amiga keyboard and are simple to operate.

For the video buffs amongst you, you may like to know that the colour bars are SMPTE-style, rather than the EBU versions used in the UK. But what the heck – you probably have all the test pattern gear you'll ever need anyway.

Over to *VPG* for the rest of the test pattern news... OK, it's not as flashy or fully-featured as *VTOT* and the displays are much simpler. In fact, all you really get are dots, lines, rectangles and centre crosshairs. But again, someone somewhere will find it useful. It could be you.

Penultimately we come to *SportsText*. As with *TitleGen* and *sMOVIE* this requires the use of a text editor. What it does is allow you to put a caption on the screen by pressing a two letter code from the keyboard. The documentation says it was written, as the name suggests, for identifying sports players – and indeed the demo supplied is for an old Chicago Bears line-up. So you just put your script together, in a format such as this:

```
22 22:Player Name
35 35:Player Name
```

Then all you need do when running the program is to load the script, key in your required number, 22 for instance, press [Return] when you'want the caption to appear and you're in business. No scrolling or anything flash, but you can set the vertical position for the text, a degree of drop shadowing and font style and colour.

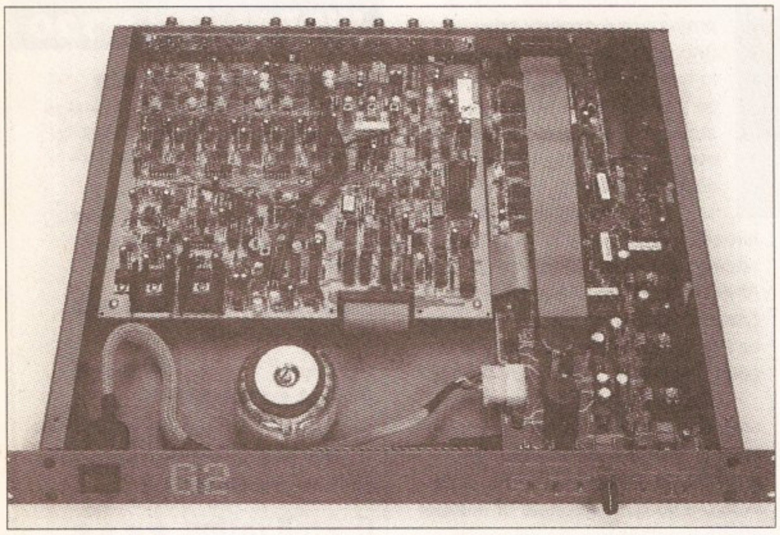
And finally, the *LogTape* program. This is a simple program which allows you to log and comment your video tapes so that you can print out details for your archives or editing purposes. I'm not sure of its value as a production tool, as I generally log by hand directly on to logging sheets; and as it doesn't read any kind of time code from the tape, I would suspect that it may be more of a hindrance than a benefit, as you would have another set of buttons to stop and start while you were logging. But who am I to comment. Someone obviously had a need to write this one, so it must be of some use.

Well, there you are. If you're strapped for cash or need a few more tools to help your video production, check this disk out. You'll need to do a bit of work if you want to use the programs from hard disk or from your own custom disks, and it would be nice if Electriclown had made them icon driven as well as overall menu driven. But there you go. At the price (£2) you can hardly complain.

continued from page 31

Lock it or lose it 2

The Amiga is continually gaining ground in the broadcast video market, mainly through third-party manufacturers developing products which demonstrate just how good the machine can be. The G2 VideoCenter VC3 is one such product.


The VideoCenter VC3 is a broadcast-quality genlockable video coder. No frills here – just good, solid quality.

G2 Systems is are a British company with a long track record in designing equipment for broadcast graphics and video production. The company has been building equipment for the Amiga for some time and its range currently includes domestic, industrial and broadcast-quality genlocks and the VD2001 24-bit graphics card.

The VideoCenter VC3 is a mains-powered, broadcast-quality (CCIR/PAL, meeting the IBA code of practice standard), genlockable coder which comes in a dark grey, professional-style, rack mounting box which is 1U high (around 4.5cm), 30cm deep and 49cm wide. It has all its control switches and adjustments easily accessible on the front panel.

The VC3 unit itself has no controls for mixing and fading the Amiga and video signals, but an external controller (the RMC1) can be added at extra cost. Alternatively, the VC3 can be controlled via the Amiga's parallel port and software commands – though the remote control still needs to be connected.

It is necessary to connect the VC3 to a reference video signal (such as that from an SPG) so that it can be correctly timed to the rest of the system. The VC3 can provide a variety of output formats – RGB, Y/C, Y/CrCb and composite video. It is able to do this by switching the signals to multi-purpose BNC/miniDIN outputs on the rear of the unit.

In addition to these selectable outputs there are RGB, sync, PAL and Y/C outputs available at all times – so that a monitor can be connected or the signal output to test equipment. There are no direct connections out to Amiga monitors, but G2 can supply cabling solutions to most monitor problems.

REMOTE CONTROL

The RMC1 is a smallish, wedge-shaped unit with two faders (Crossfade and Fade to black) and three switches (Key, Background and Amiga). It connects to the VC3 via 9-pin D connectors. It is used to control the keyer output – with effects as in table 1.

In operation, the RMC1 works smoothly and easily – although there is a tendency for keyed images to become black before the background with screen fades to black.

A switch on the VC3's front panel controls the key type – where B/Ground simply takes Amiga colour 0 as the key colour and F/Ground allows selection from 16 colours by use of the nearby rotary control.

CRISP AND EVEN

The output quality from the VC3 is excellent – sharp and well-coloured. A colour bar generated on the Amiga gave perfectly acceptable results on vectorscope and waveform monitors. I had to make some small adjustments to the VC3 phase controls (horizontal phase and subcarrier) to align it with the system we were using, but otherwise there was no need to make other, internal adjustments.

Remember that we are dealing here with a piece of broadcast equipment. It is generally accepted that quality costs money, and that the buyer will also have other equipment in their system to connect to, such as a vision mixer – hence no wipes or other tricks are included on the VC3. Just good, solid quality. AS

TABLE 1

Switch	Fader: Fade	Fader: Black
Key	Fades keyed image to background	Fades screen to black
Background	No effect	Fades background to black
Amiga	Crossfades between Amiga and background	Fades screen to black

CHECKOUT VideoCenter VC3

Documentation ●●●○○
Flimsy and poorly presented – but it contains all you need to know.

Ease Of Use ●●●○○
Very simple to set up and use.

Features ●●●●●
Most current video formats are catered for, and the remote controller adds control over keys and fades.

Hardware ●●●●○
In general the unit is very well built, although the top could be more substantially attached to the front panel.

Quality ●●●●○
Very good – crisp and stable.

Price ●●●●○
£1,695: broadcast quality = broadcast price.

Overall rating ●●●●○

SHOPPING LIST

EMR Videopilot
V320 main unit......................£850
Multiplexer.............................£75
PCM Decoder...........................£85
Time Code modifications £100
Extra infra red units..........£50 each
33 pin parallel cable £30

Available from:
EMR Video
The Barn Business Centre
Great Rissington
Cheltenham
Gloucestershire
GL54 2LH
☎ 0451 810185

VideoCenter VC3
VC3 main unit.....................£1,695
RMC1 remote controller..........£300

The unit is also available in other versions (VC3B and VC3C), which are less versatile than the VC3. Contact G2 for more details.

Available from:
G2 Systems
5 Mead Lane
Farnham
Surrey, GU9 7DY
☎ 0252 737151

(All the above prices exclude VAT)

Electriclown disk 14 ....£2.00
(including P & P and VAT)

Available from:
Electriclown
Fen House
90 Notley Road
Lowestoft
Suffolk
NR33 0UG
☎ 0502 566752

Hobbyte

COMPUTING

ESTABLISHED 7 YEARS

10 MARKET PLACE
ST. ALBANS
HERTS AL1 3DG
TEL (0727) 56005/41396

THE GALLERY
ARNDALE CENTRE
LUTON, BEDS LU1 2PG
TEL (0582) 457195/411281

AMIGA STARTER PACK

1MB AMIGA

Full Amiga 500 pack, WITHOUT Cartoon Classics/Screen Gems software: BUT WITH:
15 disc Hobbyte PD Greats pack, including Virus Killers, the Best Star Trek and other top ten games, Arcade Classics, Board Classics, Best of the Utilities, Home pack including Word Processor, Spreadsheet, Database,
10 blank disks, mouse mat, Joystick

512K AMIGA £299
1 MB AMIGA £325

AMIGA GAMES PACKS

1MB AMIGA

CARTOON CLASSICS OR SCREEN GEMS

Full Amiga 500 pack, **PLUS:** Lemmings, The Simpsons - Bart v The Space Mutants, Captain Planet and the Planeteers, Deluxe Paint III (Deluxe Paint II with 512K Cartoon Classics)
OR Screen Gems software: Shadow of the Beast II, Back to the Future II, Days of Thunder, Nightbreed, Deluxe Paint II

512K AMIGA £329
1MB AMIGA £349

DP III instead of DP II (1MB only) ADD **£29**
Screen Gems S/W Pack only.............................. **£35**
Cartoon Classics S/W Pack only.......................... **£35**

AMIGA THE LOT!!

1MB AMIGA

EVERYTHING YOU COULD EVER NEED!!
CARTOON CLASSICS OR SCREEN GEMS GAMES PACK
AS LEFT, PLUS: 10 GREAT INDIVIDUALLY PACKAGED GAMES - previous RRPs £19.99-£39.99 each, phone to choose from current list of 15, or leave it to us! Children's games available.
15 DISC HOBBYTE PD GREATS PACK, including Virus Killers, the BEST Star Trek Computer Conflict, Breakout and construction Kit, Blizzard and other games, Arcade Classics, Board Classics, Shoot-em-Up Classics, Best of the Utilities, Home pack including Word Processor/Spell Check, Spreadsheet, Database
Dust Cover, 10 Blank Discs, Disc Box, Mouse Mat, Microswitch Turbo Joystick

512K Amiga £365
1MB Amiga £389

WITHOUT CARTOON/SCREEN GEMS S/W DEDUCT £20

ABSOLUTE BEGINNERS PACK

4-9 YRS

FULL AMIGA 500 PACK, PLUS:
POSTMAN PAT, SNAP, SNAKES AND LADDERS, LUDO
FUN SCHOOL 2 (specify under 6 years, 6 to 8 years, or 8+ years) AND **FUN SCHOOL 3** (specify under 5 years, 5 to 7 years, or 7+ years)
12 stunning UK educational games with beautiful pictures, exciting animation and music that help to develop number, word and other skills. Up to 6 skill levels. Conform to National Curriculum requirements.
HOBBYTE EDUCATIONAL PACK, featuring up to 12 'Learn while you play' games (varies according to age group)
HOBBYTE 30 EASY CHILDREN'S GAMES,
10 disc pack inc; Train Set Game, Flashbier.
JOYSTICK

512K AMIGA................................£355
1MB AMIGA.................................£375
ABSOLUTE BEGINNERS S/W PACK....£55

HOBBYTE EXCLUSIVE

AMIGA FIRST STEPS

EXPANDED EDUCATIONAL/APPLICATIONS PACK
FULL AMIGA 500 PACK, PLUS:
A501 512K RAM expansion
Lets Spell at Home, Music Mouse, Prowrite WP, InfoFile spreadsheet, Deluxe Paint II, Deluxe Print, Music Mouse, LOGO, Talking Turtle, BBC Emulator, 5 BBC programmes, 10 discs, DOs and DON'Ts poster, Resource File, In Pack Video, NAPE Booklet.
HOBBYTE EDUCATIONAL PACK, featuring up to 12 'Learn while you play' games (varies according to age group)
HOBBYTE 30 EASY CHILDREN'S GAMES, 10 disc pack inc; Train Set Game, Flashbier.
JOYSTICK ~~£525~~*

***STOP PRESS - 'FIRST STEPS' NOW £449**

DP III instead of DP II ADD **£29**
FIRST STEPS SOFTWARE UPGRADE PACK £149

AMIGA 1500/2000

Full UK spec, latest version with 1MB RAM, mouse, expansion as B2000, manuals and operating discs, available as:

A1500/2000 PLUS:15 DISC HOBBYTE PD GREATS PACK
including Virus Killers, the BEST Star Trek, Computer Conflict, Breakout and construction Kit Blizzard and other games, Arcade Classics, Board Classics, Shoot-em-Up Classics, Best of Utilities, Home Pack including Word Processor/Spell Check, Spreadsheet, Database.

	Without monitor	With CBM stereo monitor
DUAL DRIVE	519	729
SD + 2091/52 MB QUANTUM HD	829	1039
SD + 2091/52 MB QU HD + 2MB	889	1099
SD + 2091/100 MB QU HD	949	1159

A1500/2000 PLUS: A1500 SOFTWARE PACK including The Works, Platinum database, WP, Spreadsheet, Deluxe Paint III, PLUS EITHER: Sim City, Populous, Their Finest Hour, Battlechess, A-Z of Computer Jargon, 'Get the most out of your Amiga', **OR:** Puznik, Toki, Digita Home Accounts, Amiga Book.
PLUS: 15 DISC HOBBYTE PD GREATS PACK AS ABOVE

	Without monitor	With CBM stereo monitor
DUAL DRIVE	619	819
SD + 2091/52 MB QUNTUM HD	949	1159
SD + 2091/52 MB QU HD + 2MB	1049	1229
SD + 2091/100 MB QU HD	1079	1289

A500 TO 1500/2000 TRADE IN

Dual Drive, with Hobbyte 15 Disc PD Greats Pack,
but without A1500 software pack or monitor....................£399
As above with A1500 S/W pack....................................£479
As above with A1500 S/W pack plus CBM stereo monitor .£679

Single Drive plus 52MB Quantum Hard Drive and 2091 controller, with Hobbyte 15 Disc PD Greats Pack,
but without A1500 software pack or monitor....................£699
As above with A1500 S/W pack....................................£799
As above with 1500 S/W pack plus CBM stereo monitor £999
As above with 1500 S/W +1950 + Flicker Fixer................£1299

A500 PROFESSIONAL FAMILY PACK

NEW

FULL AMIGA 500 PACK
PLUS: Cartoon Classics, Lemmings, The Simpsons, Captain Planet, Deluxe Paint III
PLUS: The Works Platinum, WP, Spreadsheet, Database
PLUS: Their Finest Hour Flight Simulator **AND** Battlechess **OR ANY** Fun School
PLUS: 10 Blank Discs, Disc Box, Mouse Mat, Dust Cover, Joystick + 15 disc Hobbyte PD Greats Pack (see 'The Lot')

1MB Amiga Pack.......................................£449
1MB Amiga Pack PLUS CBM Monitor ..£659
1MB Amiga Pack PLUS Citizen Swift 24 Colour Printer and leads £719

A3000 WITH 1950 MONITOR OFFER

PRICES EX VAT

A3000 25/40 25 MHz, 40 MB HD, 2MB RAM, 1 x 3.5" 880K floppy, keyboard **£1989**
A3000 25/100 25 MHz, 100 MB HD, 2MB RAM, 1 x 3.5" 880K floppy, keyboard **£2199**
4MB static RAM for A3000 £279

PHONE FOR DETAILS OF 1950 OFFER

A3000 Trade in price as above less £150 - £200. Please phone.
Please see under "Extras" for additional expansion

CBM CDTV

A revolutionary new concept in home entertainment and education. Amiga based with a professional CD system and infra-red remote control unit, it is similar in appearance to a VCR and simply connects to your television (and your hi-fi system if you wish) for incredible interative multimedia sound and graphics effects. The CBM CDTV plays:

STANDARD CD AUDIO DISCS:.
CD+GRAPHICS DISCS: Display on-screen graphics as accompaniment to CD audio track.
CD KARAOKE DISCS: With CD audio backing, the words displayed on the TV screen, mixer unit and stereo microphone, you have your own high qulaity Karaoke system for a fraction of the normal commercial cost.
CD MULTIMEDIA TITLES: Similar to computer games and educational titles but better. CDs have a massive 540MB storage capacity. Contolled by user via remote control unit.

CDTV SYSTEM.. **£599**
INCLUDES: CDTV player, infra red remote control unit with batteries, Hutchinsons Enclyclopaedia inc 25,000 entries, 7,000 biographies, 250 tables, Lemmings - top selling game, Welcome disc, disc caddy, manual, cables.

CDTV KARAOKE

CDTV KARAOKE SYSTEM.................................. **£699**
As above, complete with Sony Stereo Microphone, Mixer Unit, leads, plus any one Karaoke disc, containing 18 top Karaoke titles.

CDTV PROFESSIONAL KARAOKE SYSTEM............ **£999**
As KARAOKE system above,
PLUS any TWO Karaoke discs, containing 36 top Karaoke titles,
PLUS a pair of high quality Bose Lifestyle Roommate Speakers and leads, (30W rms full range powered speaker system) for truely professional sound.
Telephone for full list of CD+G, Multimedia and Karaoke Titles

EXTRAS inc VAT

Star LC200 colour printer with leads £195
Star LC24-200 colour printer with leads........................£289
Citizen Swift 9 pin colour printer with leads..................£189
Citizen Swift 24 pin colour printer with leads £274
Commodore or Philips stereo colour monitor, + leads £229
Second external 3.5" drive with daisychain through port and disable switch....£47
PC 880 anti-clickext. drive..£55
A501 The Official CBM 512K RAM exp £39
512K RAM Expansion + Clock.....................................£29
1.5 MB RAM Board (needs KS 1.3)...............................£75
GVP A500 50 MB HD+2MB £619
AT once AT Emulator for A500 ....£199
A590 20MB Hard drive...£264
A590 20MB Hard drive + extra 2MB £319
A590 52MB Hard drive...£399
A590 52MB Hard drive + 2MB....................................£469
10 blank discs 100% guaranteed with PIN no in box...............£6.99
50 blank discs 100% guaranteed with PIN no.......................£16.99
Rendale 8802 Genlock...£145
G2 Genlock for 2000/1500...£570
A2300 internal genlock for 2000/1500.............................£99
A2088 XT Bridge Board, 640K, MS DOS 3.3 + 5.25" drive, for 2000/1500 .£139
2286 AT Bridge Board...£569
A2058 8MB RAM exp board, populated to 2MB, for 2000/1500 ....£199
8UP 8MB RAM exp board, pop to 8MB for 2000/1500 ....£349
A2630 68030 card, populated to 2MB for 2000/1500.................£999
Microway Flicker Fixer for 2000/1500.............................£125
A2091/52MB Quantum Autoboot HD for 2000/1500...................£349
A2091/100MB Quantum Autoboot HD for 2000/1500..................£499
A1950 high res col. monitor for 2000/1500 (needs Fl. Fix.) and 3000........£399

ORDERING:

TELESALES NO: (0727) 56005

Next day delivery for credit card orders placed before 4.00pm subject to availabilty. Alternatively send cheque, postal order, bankers draft or official order (PLCs, Education and Government bodies only) to; **Dept. AS, Hobbyte Computer Centre, 10 Market Place, St. Albans, Herts AL3 5DG.** Please allow 7 working days for cheque clearance. Subject to availability, despatch is normally within 24 hours of receipt of cleared payment. Prices are correct at time of going to press, however, we are sometimes forced to change them, either up or down. Please check before ordering.

DELIVERY CHARGES:	UK Mainland (not Highlands)
Small comsumables & software items	Despatched by post, please check charges when ordering
Other items, except lasers	Next day courier service, £10 per box
Laser printers	Next day courier service, £17.50
Offshore and Highlands	Normal rate plus £20 + VAT per box

In addition we offer the following express services:

Saturday deliveries	Normal rate plus £10 + VAT per box
7am to 9am next day	Normal rate plus £10 + VAT per box
Am next day	Normal rate plus £5 + VAT per box

NO DEPOSIT CREDIT FACILITIES (UK mainland)

Credit terms at 34.8% APR (variable) can be arranged for puchases over £150, subject to status. Competitive leasing schemes are also available for businesses, including sole traders and partnerships. Just tel for written details and application form.

CBM 1084SDI OR PHILIPS 8833 COLOUR MONITOR, LEADS (WITH ANY PACK) **£219**
CITIZEN SWIFT 24 COLOUR, PRINTER, LEADS (WITH ANY PACK) **£269**

COMMODORE PREMIER DEALER

Hobbyte proudly announce this highest CBM accolade, awarded to only the top few dozen CBM dealers offering the best in expertise and support. **All Amigas full UK versions.**

TELE-ORDER (0727) 56005

CALLERS WELCOME AT OUR BRANCHES OPEN 9-5.30, Monday to Saturday

Amiga prices, except where stated are inc. VAT. E.&O.E.

Conceptually brilliant

> **"Of all the computers I've owned (or still own), my A500 has far and away the best keyboard. So why should I bother paying out almost 200 quid for another?"**
> **Pat Winstanley**

Pat Winstanley takes a look at a replacement Amiga keyboard with a difference...

In an ideal world, everyone would be able to use a standard keyboard. However, a large number of people are either physically handicapped or are simply too young to have yet acquired the basic dexterity most adults take for granted.

The Concept Keyboard is aimed at anyone who finds standard methods of interfacing with a computer get in the way of interacting with a program. Although originally developed for 'special needs', the keyboard has many other applications and as such is well worth a look.

WHAT'S DIFFERENT?

The Concept Keyboard is around the same size as the Amiga keyboard, but much flatter. Inset into the surface is an A4 touch-sensitive pad divided into 256 cells. Each cell is capable of emulating a keypress or string of keypresses, and several cells can be grouped together, all giving the same result. In this way it is possible to split the keyboard into several large sections pertinent to the controls needed for a specific program.

For instance, most programs only use a limited range of controls, perhaps half a dozen or so, and thus the qwerty keyboard is more or less redundant. For youngsters unfamiliar with the standard keyboard, or adults or children with mobility and/or learning difficulties, the Concept Keyboard offers a method of dispensing with all the non-relevant keys, so making physical or intellectual selection much easier.

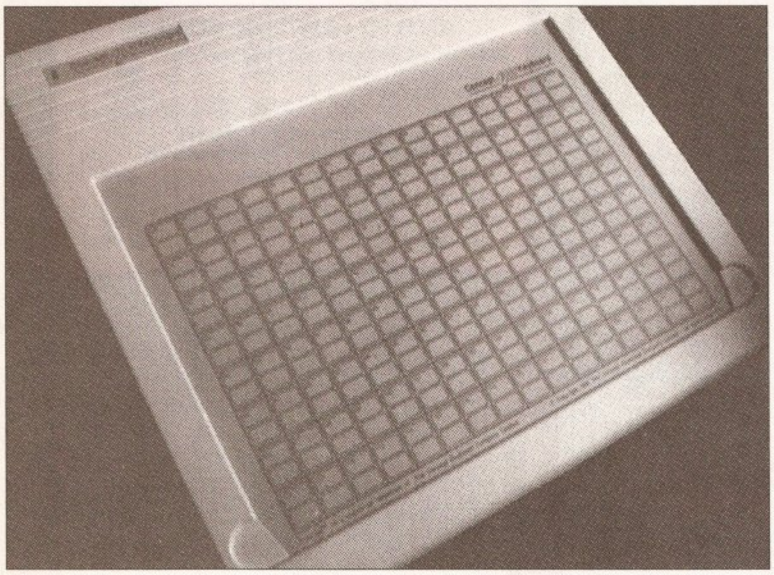
This is particularly useful for physically handicapped people who find it difficult to direct their hands to a necessarily small area on a standard keyboard. With Concept an overlay can be prepared to match any person's dexterity.

HOW DOES IT WORK?

For each program, an A4-sized paper overlay is prepared. This simply slots over the keyboard and shows the areas to be pressed for any particular key or key-sequence to be activated. So a program almost totally under cursor control, with perhaps the [Esc] and [Return] keys also needed occasionally, would need an overlay of only six areas.

Obviously, many programs can use the same basic overlay, but others need their own custom-designed sheet. The keyboard is supplied with four ready-prepared paper overlays covering word processors (such as Notepad), Logo, *KindWords* and a special sheet to help you design your own overlays using non-qwerty characters.

Also supplied is software which contains the computer overlays for those programs together with a designer for making your own and a manager for attaching the overlays to other stand-alone programs.



The Concept Keyboard: great hardware, but the software lets it down a little.

DESIGNER PROBLEMS

In theory, designing your own overlays should be simple. The software presents a screen divided into cells matching those on the keyboard. Click on a cell or group of cells with the mouse to highlight the area and then type in the key or series of key presses it is to represent. In practise things aren't quite so smooth, though. Entry demands switching back and forth between the Amiga keyboard and the mouse and is downright awkward. Although the job gets done in the end, the interface is so clumsy it gets in the way of logical thought.

Another difficulty is working out the relationship between a cell on the screen and one on the Concept Keyboard. Each cell on the keyboard is numbered, but no numbers are shown on screen – either on the cells or as a tell-tale elsewhere. This can, and often does, lead to the wrong set of cells being selected.

SOFTWARE SUPPORT

The overlay must be initialised before running the main program to be used, so the system cannot be used with programs which only autoboot. However, many programs can be run from either Workbench or Shell and of those I tested, all worked to a greater or lesser degree. Programs needing little more than a number pad together with the [Return] key worked fine, but those requiring mouse control emulation proved far more difficult.

A series of attempts (lasting a whole day) to interface the Concept Keyboard with *Sim City* proved rather disappointing. Although I had been assured of the possibility I found it impossible to do any more than scroll around the landscape. Mouse button presses simply weren't recognised. If, as an experienced user with a fair understanding of the Amiga I was unable to sort it out, I shudder to think of the difficulties faced by parents and teachers unused to the machine.

OVERALL

The Concept Keyboard is a well made, nicely designed product with potential applications in a wide range of situations, from the nursery through to industry – in fact, anywhere that the standard qwerty keyboard is not needed in its entirety. However, until the overlay software (and its manual) is improved, accessibility to overlays other than those supplied will remain a minefield for the inexperienced Amiga user. AS

SHOPPING LIST

Concept Keyboard plus overlay software £188
Available from HB Marketing
Unit 3, Poyle 14,
Newlands Drive, Colnbrook,
Slough SL3 0DX
☎ 0753 686000

CHECKOUT
CONCEPT KEYBOARD

Hardware ●●●●○
Solid construction but a little lightweight, causing it to slide on flat surfaces.

Software ●○○○○
The idea's there, but poor implementation makes the simplest thing unnecessarily hard work.

Ease of use ●●●○○
Using the supplied overlays is a doddle, but customising your own is a nightmare.

Speed ●●●●○
Although not instantaneous, the keyboard response is fast enough for most users (who are likely to be physically slow anyway).

Documentation ●●○○○
The keyboard manual is simple and clear, giving all required details. The software manual needs a full revamp to be half way comprehensible to the average user.

Price ●●●○○
Although at £188 it's expensive for home use, the Keyboard and software represent reasonable value for educational establishments – especially given the potential application range.

Overall rating ●●●○○
Excellent, simple to operate hardware let down badly by poor bundled software.

CARTOON CLASSICS MEGA 21

New GORDON

21 MEGA GAME 1Mb

HARWOODS POWERPLAY PACK 1 COMES OF AGE WITH 21 GREAT GAMES AND INCLUDES 1Mb. AMIGA CARTOON CLASSICS WITH THE SIMPSONS, LEMMINGS AND CAPTAIN PLANET PLUS 18 SPECIAL GAMES ONLY FROM HARWOODS!!!

ALL OUR AMIGAS ARE UNITED KINGDOM SPECIFICATION AND INCLUDE THE FOLLOWING...

1 Mb. Disk Drive
1Mb Ram Memory
'Notepad' Simple Word Processor
TV Modulator
4096 Colours
Multi Tasking
Speech Synthesis
4 Channel Digital Stereo Sound
Amiga Mouse
Operation Manuals
Workbench 1.3 Disks
ALL Connecting Cables

PLUS...All OUR Amigas are backed by Harwoods Great Service

[Please see full details in our Ordering Made Easy' panel final page]



MEGA 21 POWERPLAY PACK ONE

THAT'S RIGHT HARWOODS HAVE PUT TOGETHER THE ULTIMATE AMIGA PACKS YET AGAIN... STARTING WITH POWERPLAY PACK 1 WHICH INCLUDES 21 GREAT GAMES!

Just look at what you get NOW...

- **AMIGA A500 COMPUTER WITH GENUINE COMMODORE 0.5Mb UPGRADE TO A FULL 1Mb.**
- **THE SIMPSONS, BART vs THE SPACE MUTANTS** - Thats right man! you can play the computer version of this popular TV cartoon. By Ocean.
- **CAPTAIN PLANET** - created from the award winning TV show, now's your chance to save the earths environment with this ultimate adventure... your Eco-Copter is waiting. By Mindscape.
- **LEMMINGS** - Are you as smart as Lemmings are stupid, match your intelligence against their lack of it as you play the 140 levels of the most original game of '91 (European Computer Leisure Awards Winner). By Psygnosis.
- **EDUCATIONAL BASIC LANGUAGE** FOR CREATING YOUR OWN PROGRAMS
- **NOTEPAD** SIMPLE WORD PROCESSOR
- **DELUXE PAINT III** GRAPHICS PACKAGE WITH ANIMATION
- **TAILORED DUST COVER AND MOUSE MAT**
- **AND THE SUPERB COMPETITION-PRO STAR,** FULLY MICROSWITCHED JOYSTICK - The first and only joystick to date, to receive a100% magazine review rating.
- **PLUS.... 18 MORE GREAT GAMES,** THERE'S SOMETHING FOR EVERYONE...

BLOODWYCH - Fantasy role-playing game, great interaction with your computer created environment
BUBBLE+ - Help the dawdling ghost and the soap bubble, escape from the old deserted manor house
CAPTAIN BLOOD - Astonishing creatures and animated 3D graphics, this is a game you just have to play
ELIMINATOR - A progressive multi stage flying shoot 'em up, on a long winding course, survive if you can!
HOSTAGES - You must get your team and hostages out of the terrorist overrun embassy, without loss of life
JUMPING JACKSON - In a deluge of colour and sound save, the earth from sadness and melacholy music
KRYPTON EGG - A classic Breakout game, 60 screens, separated by 6 combat sequences
LANCASTER - Your mission is to fly the classic WWII bomber on its dangerous raids over enemy territiory
LOMBARD RAC RALLY - You drive your 300 bhp Sierra Cosworth through demanding stages of the rally
PURPLE SATURN DAY - Four arcade games, an exciting high speed trip into total cosmic 3D space
SAFARI GUNS - Live the African experience in an animal sanctuary, track the poachers & ivory traffickers
STIR CRAZY (Featuring Bobo) - Bobo & his inmates are planning a stunning trampoline jump prison escape
SKYCHASE - Airborne combat for every simulation fan. In this one or two player game, battle against your MIG flying adversary in your F-16 Falcon.
SKYFOX II - Skyfox II, the only ship fast enough to carry on the Skyfox legend. Fight to blow your federation enemies from the Galaxy, at speeds of 9000 kilometres/second!
STRIKE FORCE HARRIER - Puts you in the cockpit of one of Britains most exiting fighter aircraft. Multiple skill levels let you progress to become an ace pilot
TINTIN ON THE MOON - We've been captured by Colonel Jorgen and he's tring to scupper the moon mission. Come on Tintin, you're the only one who can save us, and be the first on the moon
TV SPORTS FOOTBALL - Strap on your helmet for American football simulation that looks like the real thing.
XENON 2 MEGABLAST - This time it's war! The Xenites are back and have thrown time itself into turmoil.

CARTOON CLASSICS MEGA 21

NEW HARWOODS EXCLUSIVE!

...AND HARWOODS ALSO GIVE YOU A SUPERB BROCHURE OFFERING UP TO 16 NIGHTS FREE HOTEL ACCOMODATION IN AN EXTENSIVE SELECTION OF 400 HOTELS AROUND THE UK PLUS NOW A SPECIAL BUDGET FRANCE SUPPLEMENT IS INCLUDED!

Priced at an INCREDIBLE

£399.95

Including VAT

DON'T FORGET THAT WHILST YOU CAN OF COURSE PLAY THE GREATEST GAMES, WHEN YOU CHOOSE THE AMIGA YOU ARE ALSO GETTING A VERY POWERFUL PERSONAL COMPUTER. PROJECTS SUCH AS PROGRAMMING, GRAPHIC DESIGN, WORD PROCESSING OR OTHER BUSINESS APPLICATIONS, EDUCATION FOR A WHOLE HOST OF SUBJECTS FROM PRIMARY LEVEL TO 'O'LEVEL ARE ALL A REALITY WITH THE SYSTEM THAT YOU CAN REALLY GROW WITH AS YOUR COMPUTING EXPERIENCE EXPANDS. EUROPEAN COMPUTER OF THE YEAR 1991, EUROPEAN COMPUTER LEISURE AWARDS

**Credit terms are available (subject to status) for most products; see our ordering panel at the end of this advert for full details*

SOUND AND VISION
Words and Pictures
CDTV



IMAGINE, IF YOU CAN, A NEW, MORE POWERFUL AMIGA...

...AN AMIGA WITH 1 MEGABYTE OF MEMORY, AND A COMPACT DISK DRIVE OF ALMOST INFINITE SIZE. A DISK DRIVE SO VAST, IT CAN STORE HUNDREDS OF MILLIONS OF DIGITS OF DATA. THIS DATA COULD BE, SPEECH, ANIMATED PICTURES, DIGITISED STEREO SOUND, COMPUTER IMAGES OR WHOLE ENCYCLOPAEDIAS.... AND MORE.

IMAGINE THIS, AND YOU CAN START TO GRASP THE CONCEPT OF CDTV.

THE INTEGRAL COMPACT DISK DRIVE, IS THE KEY TO THE POWER OF CDTV. ITS STORAGE CAPACITY IS EQUIVALENT TO AROUND A QUARTER OF A MILLION FULL PAGES OF TEXT. THIS WHEN INTEGRATED WITH THE 1 MB OF INTERNAL AMIGA CIRCUITRY, CREATES A SYSTEM, WHICH FROM A CD DISK, CAN GIVE YOU ACCESS TO AN UNIMAGINABLE SPECTRUM OF REAL WORLD IMAGES, NEVER SEEN COMBINED BEFORE. THESE VIVID IMAGES, WITH WORDS AND SOUNDS, GIVE YOU A WHOLE NEW DIMENSION IN HOME EDUCATION, ENTERTAINMENT & INFORMATION TECHNOLOGY. AND... DON'T FORGET, THAT CDTV CAN PLAY IN SUPERB QUALITY, ANY NORMAL AUDIO MUSIC CD, AND IT CAN ALSO PLAY THE NEW CD+G DISKS, WHICH GIVE DIGITAL SOUND AND ON SCREEN GRAPHICS.

ON CD DISKS NOW AVAILABLE, THERE ARE EDUCATIONAL PACKAGES, ENCYCLOPAEDIAS PACKED WITH REFERENCE INFORMATION, STUNNING GAMES, MUSIC SYSTEMS AND MANY OTHER NEW AND VARIED SUBJECTS, INCLUDING WHOLE WORLD ATLASES OR EVEN THE COMPLETE WORKS OF SHAKESPEARE, EACH ON ONE CD DISK!!!

FREE CDTV STARTER PACK!!!

WHEN YOU CHOOSE YOUR CDTV FROM GORDON HARWOOD, NOT ONLY DO YOU GET OUR LEGENDARY SERVICE, BUT WE GIVE YOU A CDTV STARTER PACK, TO GET YOU EXPLORING YOUR NEW WORLD - STRAIGHTAWAY.

THIS INCLUDES A SUPERB SELECTION OF CD DISK TITLES INCLUDING THE WELCOME TUTORIAL & HUTCHINSONS ENCYCLOPAEDIA, PLUS ... FIVE GAMES, SHERLOCK HOLMES & THE HOUND OF THE BASKERVILLES, SIM CITY, A TOWN WITH NO NAME, CHAOS IN ANDROMEDA, AND THE ACCLAIMED LEMMINGS, WORTH IN TOTAL ALMOST £200.00. IN ADDITION IS THE INFRARED REMOTE CONTROLLER, AND ALL THE HARDWARE NEEDED TO GET YOU CONNECTED.

ALL THIS FOR JUST £599.95

CDTV IS THE SAME SIZE AND STYLE AS YOUR VIDEO RECORDER, SO IT CAN SIT UNOBTRUSIVELY ABOVE OR BELOW YOUR HOME TV AND/OR HI-FI. AND WITH ITS INFRARED REMOTECONTROLLER, IT CAN OPERATED FROM YOUR ARMCHAIR. BUT PERHAPS MOST IMPORTANT, IF YOU ARE A COMPUTER ENTHUSIAST, REMEMBER THAT INSIDE EVERY CDTV, IS AN AMIGA, JUST WAITING TO BE USED. SO LATER ON, YOU'LL BE ABLE TO BUY THE OPTIONAL KEYBOARD AND DISK DRIVE, TO GET INTO THE WORLD OF FULL AMIGA COMPUTING. PRINTERS, DIGITISERS, GENLOCKS AND OTHER ACCESSORIES,CAN ALL BE CONNECTEDTO GIVE ACCESS TO MANY OTHER EXCITING FACILITIES, AND ALSO MANY EXISTING SOFTWARE PACKAGES AVAILABLE FOR THE AMIGA COMPUTER RANGE. NEVER BEFORE HAS THERE BEEN SO MUCH POTENTIAL FROM ONE NEW STUNNING SYSTEM, PACKED WITH

TODAYS TECHNOLOGY.!

CALL IN AND SEE US FOR YOU PERSONAL DEMONSTRATION, OR PHONE US FOR YOUR FREE DETAILED CDTV INFORMATION PACK.

CDTV ACCESSORIES

DUE TO BE RELEASED SOON - Please call us for latest availability.

CD 1220 KEYBOARD AN 89 KEY QWERTY KEYBOARD **£49.95**

CD 1252 MOUSE TWO WAY INFRARED MOUSE AND BATTERY SAVER **£49.95**

CD 1200 TRACKBALL AN INFRARED TRACKBALL, WITH THE OPTION OF DIRECT CONNECTION TO EXTEND BATTERY LIFE. DUPLICATES FUNCTIONS OF TWO BUTTON MOUSE AND INCLUDES TWO 9 PIN PORTS FOR CONNECTION STANDARD JOYSTICKS **£79.95**

CD 1400 CADDIES FOR HOLDING CD WITHIN DRIVE **£9.95ea.**

CD 1401 MEMORY CARD PERSONAL RAM CARD CONTAINING 64K OF MEMORY FOR STORING DATA OR AS A BOOKMARK FACILITY WITHIN CDTV **£79.95**

CD 1405 MEMORY CARD A LARGER PERSONAL RAM CARD CONTAINING 512K OF MEMORY FOR STORING DATA OR AS A BOOKMARK FACILITY WITHIN CDTV **£249.95**

CD 1800 FLOPPY DRIVE RACK MOUNTABLE FLOPPY DRIVE WITH 880K CAPACITY AND FURTHER ROOM FOR OTHER HARD DRIVES OR MODEMS ETC. **£99.95**

CD 1301 GENLOCK PAL BASED VIDEO INTERFACE CARD FOR SUPERIMPOSING CDTV IMAGES OVER A VIDEO SIGNAL PROVIDED BY ANY STANDARD VIDEO SOURCE **£149.95**

CD 1321 VIDEO CARD PAL BASED VIDEO INTERFACE CARD TO ALLOW CONNECTION TO TV'S OR VIDEOS REQUIRING UHF, S-VIDEO OR COMPOSITE INPUTS. **£TBC**

OTHER ACCESSORIES DUE TO BE RELEASED SOON - Please call .

HARWOODS AMIGA
PRO-GEN



PROFESSIONAL QUALITY GENLOCK FOR COMPUTER AND VIDEO MIXING, AT A DOWN TO EARTH PRICE!!!

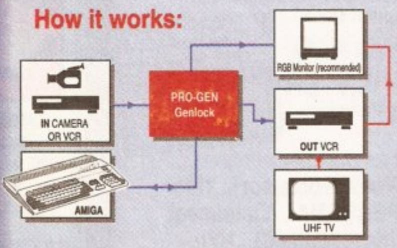
Pro-gen Amiga Genlock

The Pro-gen AMIGA Genlock allows you to mix your Amiga display with any PAL video display whether it is from a VCR, Laserdisk player or a Camcorder. In fact any item of video equipment which outputs a PAL composite video signal.Combined with the Amiga computer the Pro-Gen gives you the facilities of a desktop video editing suite. Take your own films & give them a professional look by OVERLAYING TITLES or by SUPER IMPOSING YOUR OWN GRAPHICS created in packages like Spectracolor or Deluxe Paint. Pro-Gen is supplied with Oxxi's Spectra-color paint & animation package (see below).

FREE

In Spectracolor every drawing tool and animation control is at your finger tips - over 50 tools in the fast menu Toolkit, plus point and click access to all 4096 colours, with independent right and left mouse button colours & modes. Add automatic animation generation easy mouse controls for all functions, and the ability to paint with multi-page animated brushes, and you've got a powerful tool for artistic expression. With animation controls it's simple to put your ideas into motion. Forget co-ordinate systems and reference numbers just move objects with the mouse in this intuitive and friendly graphical environment. Spectracolor supports both ANIM & IFF file formats, and all the video modes of the Amiga, including HAM!

How it works:



STOP PRESS

PRO-GEN... NOW INCLUDING A VERY VERSATILE MULTI COMPONENT VIDEO TO GENLOCK CONNECTING CABLE KIT. THIS ALLOWS PRO-GEN TO BE USED STRAIGHTAWAY WITH MOST POPULAR VIDEO EQUIPMENT, WITHOUT THE NEED TO HUNT DOWN THE CORRECT CONNECTING CABLES. THIS KIT CAN ALSO BE USED TO CONNECT IN OTHER WAYS... eg. VCR TO VCR etc.

A KIT TO START YOU OFF RIGHT FROM THE MOMENT YOU OPEN THE BOX!!!

PRO-GEN & Spectracolor ONLY £129.95

Mode Switch-box for Genlocks

Features Include
- Compatible With The Pro-Gen And Rendale 8802
- Supplied With Genlock Extender Cable Worth £9.95
- Switch-box Switches Between Foreground, Background, Video And Computer Modes.

£29.95

Credit terms are available (subject to status) for most products; see our ordering panel at the end of this advert for full details

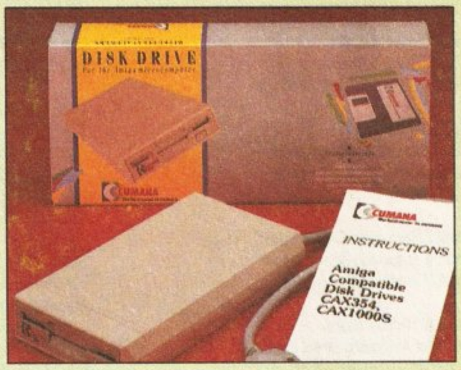
AMIGA STORAGE DEVICES

Commodore A590 20Mb HD
Features Include
- ☆ Connects to sidecar bus on left hand side of Amiga A500
- ☆ Autoboots with Kickstart 1.3
- ☆ Sockets For Up to 2 Mb of RAM
- ☆ DMA Access
- ☆ External SCSI Port
- ☆ Complete With Power Supply

A590 Hard Disk Including 512K RAM Only £299.95

A590 Hard Disk Including 1 Mb. RAM Only £319.95

A590 Hard Disk Including 2 Mb. RAM Only £349.95



Cumana CAX354 3.5" External 2nd Disk Drive.
- ☆ Features Include
- ☆ Long connecting cable
- ☆ 1Mb, (880K Formatted) Capacity
- ☆ Enable/Disable Switch,
- ☆ Throughport
- ☆ Access Light
- ☆ Compatible with Amiga 500/1000/1500/2000/3000 and CDTV

£57.95

SUPRA 500XP 52-105Mb HD
Features Include
- ☆ Capacities of 52/80/105Mb all available
- ☆ Connects to sidecar bus on L/H side of Amiga A500
- ☆ Autoboots with Kickstart 1.3, boot enable/disable switch
- ☆ Sockets for up to 8 Mb of FASTRAM with enable/disable switch
- ☆ Autoboots With Kickstart 1.3
- ☆ SCSI Port & Amiga bus pass thru allows other devices to be connected
- ☆ Includes Express Copy hard drive Back-up Software
- ☆ 52 Mb version powered by Amiga, High Current Power Supply optional. High Current Power Supply (recommended for 52Mb. version) required for 80Mb. and 105 Mb versions

SUPRA PRICES

RAM SIZE	STORAGE CAPACITY 52Mb.	80Mb.	105Mb.
512K	£499.95	*£549.95	*£659.95
2Mb.	£549.95	*£599.95	*£709.95
4Mb.	£749.95	*£799.95	*£909.95
8Mb.	£969.95	*1019.95	*1129.95

Please don't forget to add the cost of Power Supply when calculating price of 80/105Mb. drives

PERIPHERAL PACK 1

A TRULY SPECIAL PACK FROM HARWOODS TO MAKE YOUR AMIGA DO MORE THAN EVER!

Harwoods have put this pack together for you to add to your Amiga at an AMAZING SAVING over individually priced items. You get extra power from our Pro-Ram memory upgrade and EXTRA storage from the brilliant Cumana drive.

Harwoods Pro-Ram is our best selling Amiga upgrade with 16chip RAM, similar in design to CBM's A501 and works exactly the same. The Cumana CAX 354 external drive is a brand leader in the 3.5" market having received a great deal of praise over the years. And... to round off we also include a 3.5" Disk Head Cleaner too!!!

ALL THIS FOR THE AMAZING PRICE OF ONLY... £79.95

PERIPHERAL PACK 2

TWO MORE GREAT PACKAGES THAT SAVE YOU MORE MONEY!

These two packs are aimed at the designer who needs to get a great deal from his Amiga. A superb quality monitor in the PHILIPS CM8833/II has been put with a choice of either the CITIZEN SWIFT9 or the CITIZEN SWIFT 24 printer. You choose, but whichever combination you have the price has been designed to SAVE YOU MONEY. Buying together will save you £££'s!

PACK 2 with a Citizen Swift 9 Costs Just... £479.95

PACK 2 with a Citizen Swift 24 Costs Just... £569.95

AMIGA SOFTWARE

Music-X: The ultimate software for professional MIDI sequencing. The software includes a configurable librarian and a synthesiser patch editor. All the data you need to recreate a song can be recalled from one performance file including sequences, MIDI routing, sync setup, keyboard maps and synthesiser or drum machine patch libraries.

Amos: AMOS allows you to access the power of the Amiga with ease. 500 different command make AMOS a sophisticated development language. The AMOS animation language allows you to create complex animation sequences. The package is supplied with a 300 page manual with over 80 example programs on the program disc. £49.95

SuperBase 4: Most powerful database available for the Amiga.Combines the ease of use of Super-Base 2 with a versatile programming language so that you can tailor your data to your own specific needs for club/business/library records etc. £229.95

Lattice C: An ideal tool for the C programmer whether experienced or a novice. The best way to create applications for the Amiga.Fully supports Motorola chipset. Nearly 300 functions optimised to help the user write the tightest possible code. Includes screen editor. Most Amiga C books are based around lattice. £199.95

Deluxe Paint IV: Latest version of the Amigas first, and still the best, paint and animation package, now including HAM mode. (1 Mb. more recommended) £79.95

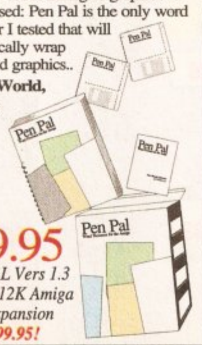
Vidi, The Complete Colour Solution: Vidi with RGB Splitter, Frame Grabber & Digitiser. Grabs moving colour video into 16 grey scale frames (up to 16 frames in 1Mb. Amiga) and digitises from still colour video source in up to 4096 colours in less than 1 second! Requires home VCR or video camera for grabbing. Requires video camera or VCR with perfect pause for digitising. Now comes with Spectracolor FREE!!! £179.95

MASTERSOUND: High quality "mono" sampler (best for sampling instruments etc.) £36.95

MIDI INTERFACE (5 Port): In, Out, Through plus 2 switchable thru'/out. Includes cable. £24.95

Pen Pal V.1.3

WORD PROCESSOR/DATABASE
With Pen Pal you can mix text, 4096 colour graphics & data in ways no other w/p can! "It's handling of graphics is unsurpassed: Pen Pal is the only word processor I tested that will automatically wrap text round graphics..
Amiga World, July '90



£79.95

PEN PAL Vers 1.3 WITH 512K Amiga RAM Expansion only...£99.95!

THE ABOVE IS JUST A SMALL SAMPLE FROM OUR EXTENSIVE RANGE OF TITLES FOR THE SERIOUS AMIGA USER. THIS WHEN COMBINED WITH OUR MASSIVE RECREATIONAL STOCK, GIVES A VAST SOFTWARE SELECTION FOR EVERYONE. IF YOU WOULD LIKE TO KNOW MORE, JUST ASK US FOR YOUR FREE COPY OF OUR SOFTWARE CATALOGUE

Remember to ask for your FREE Harwoods Amiga catalogue.

Telephone Order Line:
0773 836781
Cridit Facilities Available*

GORDON HARWOOD HARWOOD HARWOOD Computers

The Closer you look, The Better we look.

**Credit terms are available (subject to status) for most products; see our ordering panel at the end of this advert for full details*

FREE... Fully Tailored Dust Cover with all Dot Matrix Printers

PRINTERS

All printers in our range include the following standard features...

- Standard Centronics parallel port unless otherwise stated for direct connection to Amiga, PC's, ST etc. and come with a:
- FREE CONNECTOR LEAD & A FREE TAILORED DUST COVER!



When you are comparing our prices to others make sure that the same essential items are included eg. Printer Lead, Dust Cover, Postage and VAT etc.

CITIZEN 120D+ - Up to 120/25 cps — **£149.95**
Very reliable low cost printer (please specify interface on order)
- Interchangeable interfaces for Centronics RS 232 or Serial type for CBM 64 etc
- Full 2 Year manufacturers warranty

NEW FASTER STAR LC20 (Replaces LC10) - Up to 150/38 cps — **£159.95**
Replacement for our most popular Mono Dot-Matrix printer and at a super low introductory price
- Multiple font options easily accessible from front panel
- Excellent paper handling facilities
- Simultaneous, continuous and single sheet stationery
- 240 x 240 dpi Graphics

CITIZEN 124D MONO 24 PIN PRINTER — **£209.95**
- 360 dpi - 24 Pin MONO
- 8K Buffer - Expandable
- 3 Fonts, Superb letter quality
- Push & Pull Tractor feeds
- 2yr Warranty
- Feed for labels & multi-part stationery
- Low running costs

STAR LC 24-10 - Up to 180/60 cps — **£214.95**
24 Pin version of the Star LC Series with
- Exceptional letter print quality
- 360 x 360 dpi Graphics
- Additional font cartridges available
- 8 resident fonts

STAR LC200 GREAT COLOUR PRINTER - 185/40 cps — **£214.95**
This is the one in our packs!
- 80 Column Dot Matrix
- 240 dpi - 9 Pin COLOUR
- 16K Buffer, 8 Resident Fonts
- Front Panel Pitch Selection
- Push/pull tractor & rear/bottom feeds
- Reverse paper feeds
- Micro paper feed, Max. paper width 11.7"
- Supplied with colour & mono ribbons
- Paper park with auto single sheet loading
- Programmable from front panel, no DIP switches
- 12 month warranty

CITIZEN SWIFT 9PIN COLOUR - Up to 160/40cps — **£229.95**
New super high spec 9Pin colour printer
- 8K Buffer 4 Fonts
- Push and pull tractor built-in
- Feed for labels/multi part stationery
- 240 x 240 dpi Colour Graphics
- Best text quality in our 9Pin range
- 2 Year Citizen warranty

STAR LC24-200 24 PIN MONO PRINTER - 220/55 cps — **£259.95**
New Star 24 pin that means business!
- 80 Column Dot Matrix
- 360 dpi - 24 Pin MONO
- 7K Buffer expandable to 39K
- 10 Resident Fonts
- Front Panel Pitch Selection
- Push/pull tractor & rear/bottom feeds
- Reverse paper feed
- Paper park with auto single sheet loading
- Micro paper feed, Max. paper width 11.7"
- Supplied with mono ribbon
- Faster than the old LC24-10
- Extra font cartridges available
- Program from front panel, No DIP switches
- 12 month warranty

STAR LC24-200 NEW COLOUR PRINTER - 220/55 cps — **£309.95**
Colour version of the new LC24-200 Mono
- 80 Column Dot Matrix
- 360 dpi - 24 Pin COLOUR
- 30K Buffer expandable to 62K
- 10 Resident Fonts
- Front Panel Pitch Selection
- Push/pull tractor & rear/bottom feeds
- Reverse paper feed
- 12 month warranty
- Paper park with auto single sheet loading
- Micro paper feed, Max. paper width 11.7"
- Supplied with colour & mono ribbons
- Better quality than LC200 colour
- Extra font cartridges available
- Programmable from front panel, No DIP switches

CITIZEN SWIFT 24 PIN COLOUR - Up to 160/50 cps — **£319.95**
24 Pin Colour Printer
- Push and pull tractor built-in with bottom feed for labels & multi-part stationery
- 360 x 360 dpi Colour Graphics
- 2 Year Citizen warranty

NEW FASTER STAR XB PRINTER RANGE Colour XB24-200 & XB24-250 - 275/80 cps — **£399.95** 24-200 Colour — Wide Carriage **£499.95** 24-250 Colour
These NEW top of the range Stars replace the XB24/10 & XB24/15, & offer the best possible quality dot matrix printing
- Exceptional print quality
- 4 x 48Pin super letter quality fonts
- 14 x 24Pin near letter quality fonts
- Buffer: 29K(XB24/200) & 76K (XB 24/250)
- 360 x 360 dpi Colour Graphics
- 12mths on-site warranty (UK Mainland)

HEWLETT PACKARD PAINTJET A4 — **£899.95**
Our best quality full colour printer at a realistic price
- Parallel/Centronics or Serial RS232 I/F (specify with order, MAC option available)
- For presentation graphics/DTP, CAD and technical/scientific applications
- A full page of colour graphics in 4 minutes (typical)
- Non impact printing, virtually silent, 43dba
- Will print transparencies
- 12 Months on-site warranty (UK Mainland)

STARSCRIPT - 4ppm POSTSCRIPT COMPATIBLE LASER — New! **£1174.95**
Brand new A4 Laser Printer, will connect to PC, Amiga, ST and Macintosh.
- 300 DPI, 2Mb. Upgradable to 5Mb.
- Emulations inc: HP Series II, Epson EX800, IBM Proprinter & Diablo 630
- Serial/Parallel/Appletalk interfaces as standard
- 12month on site warranty (UK Mainland)
- Every desktop publishers dream

SEE OUR LIST OF ACCESSORIES FOR BOTH STAR AND CITIZEN PRINTERS, ALL AT COMPETITIVE PRICES!

All the characters Per Second speeds quoted below are Draft/LQ at 10cpi

PRINTER ACCESSORIES

CITIZEN PRINTER ACCESSORIES:

Citizen 120D+ Sheet Feeder	£69.95
Citizen 120D+ Parallel Interface	£49.95
Citizen 120D+ CBM C64 Serial Interface	£49.95
Citizen 124D 32K Buffer	£13.95
Citizen 124D Semi-Auto SheetFeeder	£39.95
Citizen 124D Automatic Sheet Feeder	£79.95
Citizen 124D Printer Stand	£24.95
Citizen Swift 9 Semi-Auto SheetFeeder	£39.95
Citizen Swift 9 Automatic Sheet Feeder	£79.95
Citizen Swift 9 Printer Stand	£24.95
Citizen Swift 9X Printer Stand	£34.95
Citizen Swift 9X Automatic Sheet Feeder	£139.95
Citizen Swift 24 32K Printer Buffer	£13.95
Citizen Swift 24 Semi-Auto Sheet Feeder	£39.95
Citizen Swift 24 Automatic Sheet Feeder	£79.95
Citizen Swift 24 Printer Stand	£24.95
Citizen Swift 24X Auto Sheet Feeder	£139.95
Citizen Swift 24X Printer Stand	£34.95

HEWLETT PACKARD PAINTJET PRINTER ACCESSORIES:

Hewlett Packard PaintJet	
Black Ink cartridge	£25.95
Colour Ink Cartridge	£31.49
Single Sheet Printer Paper	£17.95
Z-Fold Printer Paper	£15.95
Transparency Paper - Pack of 50 Sheets	£52.95

STAR PRINTER ACCESSORIES:

Star LC-20 Mono Printer	
Automatic SheetFeeder	£74.95
Star LC24-10 Mono Printer	
32K Buffer £67.95	£67.95
Automatic SheetFeeder	£74.95
Star LC-200 Colour Printer	
Automatic SheetFeeder	£74.95
Star LC 24-200 Mono Printer	
32K Printer Buffer	£34.95
Automatic SheetFeeder	£74.95
Star LC 24-200 Colour Printer	
32K Printer Buffer	£34.95
Automatic SheetFeeder	£34.95
Star XB 24-200 Colour Printer	
Pull Tractor	£34.95
Font Cartridges - Styles To Be Announced	£29.95
128K Centronics Printer Buffer	£89.95
Automatic SheetFeeder	£114.95
Dual Bin SheetFeeder	£429.95
Star XB 24-250 Colour Printer	
Pull Tractor	£34.95
Font Cartridges - Styles To Be Announced	£29.95
128K Centronics Printer Buffer	£89.95
Automatic SheetFeeder	£174.95
Dual Bin SheetFeeder	£469.95



GENUINE CITIZEN & STAR REPLACEMENT PRINTER RIBBONS

PRINTER	PRINTER TYPE	BLACK RIBBON	BLACK RIBBON X6	COLOUR RIBBON	BLACK RIBBON X6
CITIZEN 120D+	BLACK ONLY	£4.95	£24.95	N/A	N/A
CITIZEN 124	BLACK ONLY	£4.95	£24.95	N/A	N/A
CITIZEN SWIFT 9	BLACK/COLOUR	£4.95	£24.95	£16.95	£99.95
CITIZEN SWIFT 24	BLACK/COLOUR	£4.95	£24.95	£16.95	£99.95
STAR LC10/20	BLACK ONLY	£4.95	£24.95	N/A	N/A
STAR LC200 C	BLACK/COLOUR	£6.95 ZX9	£36.95 ZX9	£12.95 ZX9CL	£69.95 ZX9CL
STAR LC24/200 M	BLACK ONLY	£8.95 Z24	£49.95 Z24	N/A	N/A
STAR LC24/200 C	BLACK/COLOUR	£8.95 Z24	£49.95 Z24	£14.95 X24CL	£74.95 X24CL
STAR XB RANGE	BLACK/COLOUR	£8.95 Z24	£49.95 Z24	£14.95 X24CL	£74.95 X24CL

BOOK SHOP FOR BEGINNERS & EXPERTS ALIKE



WE ALWAYS CARRY LARGE STOCKS OF THE FULL RANGE OF ABACUS BOOKS...Phone us for details!

AMIGA FOR BEGINNERS - VOL. 1 ABACUS BOOKS, — £12.95
From unpacking your Amiga to creating your own icons, includes first use of basic and extras disk.

AMIGA BASIC INSIDE AND OUT - VOL 2 ABACUS BOOKS, — £18.95
Definitive step by step guide to programming Amiga's in basic.

AMIGA MACHINE LANGUAGE - VOL 4 ABACUS BOOKS, — £14.95
Practical guide to learning 68000 assembler language.

AMIGA DOS INSIDE AND OUT - VOL 8 ABACUS BOOKS, — £18.45
Guide to Amiga DOS & CLI. NEW Edition inc. DOS v 2.0

AMIGA HARDWARE REFERENCE MANUAL-Addison Wesley, — £21.95
Written by technical experts at Commodore Amiga Inc, USA... People who designed your Amiga. Hardware level machine code programming at advanced level.

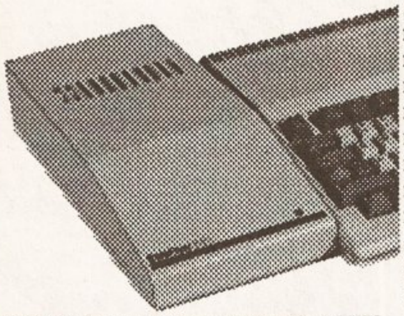
AMIGA, BEST OF TRICKS & TIPS Vol. 17, — £32.95
A complete set of tricks and tips that enable you to do MORE with your Amiga and as simply as possible.

Prices correct at time of going to press. E&OE

AMIGA HARD DRIVES From AMIGA SUPERMARKET

THE DATAFLYER™ 500 FOR ALL AMIGA 500s

IN STOCK



SPECIFICATIONS.

- 56 or 130 meg LOW POWER SLIMLINE NEC DRIVES
- AUTOBOOTING (DEFEATABLE)
- FAST 25ms ACCESS TIME
- QUICK STARTUP & AUTOPARK
- OPTIONAL INTERNAL 2 - 8 MEG RAM CARD
- ROBUST AMIGA COLOURED ALLOY CASE
- SCSI INTERFACE COMPATIBLE WITH MOST SCSI DRIVES.
- NO NOISY FAN !

DATAFLYER 500 56 meg	£369.99
DATAFLYER 500 130 meg	£499.99
DATAFLYER MINUS DRIVE	£129.99

Prices inc vat & carriage.

SUPERB VALUE FOR MONEY
100s SOLD TO DATE.

The DATAFLYER 500 comprises an Amiga coloured alloy case housing a state of the art SCSI interface & one of the latest, quiet, self parking, NEC low power slimline hard drive units.
The Dataflyer 500 connects directly to the A500's expansion port & offers fast 25ms access to all your programs & data. The autobooting feature (defeatable by holding down the mouse button on power up) means you probably won't need the Workbench disk ever again !

What the Press said...
AMIGA WORLD, a leading US magazine compared five SCSI hard drives. The Dataflyer, despite costing less than all the others, came out top in 3 out of 5 tests, & when taking cost into account clearly came out way ahead of every rival.

"... this is the first packge to seriously challenge the A590 for value for money." concluded the review in AMIGA USER INTERNATIONAL - sept 1991 issue.

THE DATAFLYER 2000 FOR AMIGA 1500 & 2000

A 'HARD CARD' version of our DATAFLYER 500.
Comprises Dataflyer SCSI interface fitted with 56 or 130 meg NEC slimline low power hard drive unit. Together these form a'hard card' which fits inside the Amiga 1500 or 2000, occupying one of the expansion slots. Same spec as the Dataflyer 500.

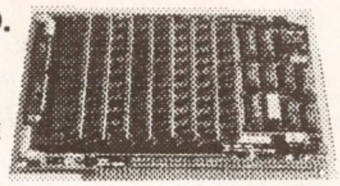
DATAFLYER 2000 56meg	£329.99 inc vat & carriage
DATAFLYER 2000 130meg	£459.99 inc vat & carriage
DATAFLYER SCSI CARD ONLY	**£89.99** inc vat & carriage

A590 HARD DRIVE UPGRADES

Upgrade your A590 with a state of the art quiet, fast access, self parking NEC SCSI hard drive. 56 or 130 meg capacities (unformatted) - as fitted to our Dataflyers.
Simply fit in place of the original unit, & uses the A590 setup disk for formatting & partitioning.Full instructions supplied.

A590 56meg UPGRADE - only £249.99 inc vat & carriage
A590 130meg UPGRADE - only £399.99 inc vat & carriage

DATAFLYER RAM CARD.



- 2 - 8 meg MEMORY CARD.
- USES 1meg * 9 SIMMS
- HIGH QUALITY 4 LAYER DESIGN
- FULLY BASEBOARD™ COMPATIBLE
- AUTOCONFIGURING

The DATAFLYER RAM CARD is a very high quality memory expansion card which provides upto 8 megs of memory in 2 meg steps. It connects to the Dataflyer SCSI interface, or can be used on its own in the A1500 & 2000 as a memory expansion card.
It uses 1meg * 9 bit SIMM modules (2 min - 8 max = 2 - 8megs), which simply clip into the on board sockets. The circuit board uses a four layer design which keeps the power & ground tracks separate for enhanced reliability.
It is Autoconfiguring & is fully compatible with our Baseboard A500 internal 4 meg memory expansion.

DATAFLYER RAM CARD (unpopulated) £79.99
1meg * 9 SIMMS (min of 2 req'd) £39.99 each

TRILOGIC,
UNIT 1, 253 NEW WORKS RD,
BRADFORD, BD12 0QP
SALES: 0274 691115
Fax: 0274 600150
Payment accepted by cash, po, cheque, Access or Visa.

DISCS



from 28p

	3.5" DS/DD	3.5" SONY
25	9.99	12.99
50	18.99	23.99
100	32.99	43.99
250	76.99	107.99
500	148.99	199.99
1000	284.99	389.99

LOCKABLE DISC BOXES

40 x 3.5	-	£3.99
80 x 3.5	-	£4.49
120 x 3.5	-	£6.49

DISCS

***Our disks are fully guaranteed and come complete with labels.**

RIBBONS *Post Free*

	1 OFF	3 OFF
CITIZEN 120D/LSP10/124D SWIFT 24	2.50	2.30
CITIZEN SWIFT 24 COLOUR	15.00	–
EPSON FX/MX/RX80/FX800/LX800	3.20	3.00
EPSON LX80/86	2.00	1.80
MANNESMANN TALLY MT80	4.80	4.60
PANASONIC KXP 1080/81/82/180/1190/1123	2.90	2.70
PANASONIC KXP1124/1140	2.60	2.40
STAR LC10 MONO	2.80	2.60
STAR LC10 4-COLOUR	5.90	5.70
STAR LC24-10	2.80	2.60
STAR LC24-10 COLOUR	12.50	–
STAR LC200	3.20	3.00
STAR LC200 COLOUR	11.50	–
STAR LC24-200	2.80	2.60
STAR LC24-200 COLOUR	12.50	–



SNAP COMPUTER SUPPLIES LTD

ACCESSORES - POST FREE!

Amiga External Drive	57.99
Amiga 512k Upgrade, clock	23.99
Amiga 512k Upgrade, No clock	21.99
Mouse Mat (Boxed)	2.99
Mouse Holder	2.99
2 Piece Universal Printer Stand	6.99
31/2 Disk Clean Kit	2.99
51/4 Disk Clean Kit	2.99
Roll of 1000 31/2 disk labels	8.99
Printer Cable (1.5mtr)	3.99

PAPER *Top Quality*

FANFOLD WITH MICRO-PERFS	1000	2000
11 X 9.5 60GSM	7.99	13.99
11.66 X 9.25 (A4) 70GSM	10.49	18.49
11.66 x 9.25 (A4) 80GSM	11.99	20.49
11.66 x 9.25 (A4) 90GSM	13.99	23.99

SORRY! MAIL ORDER ONLY

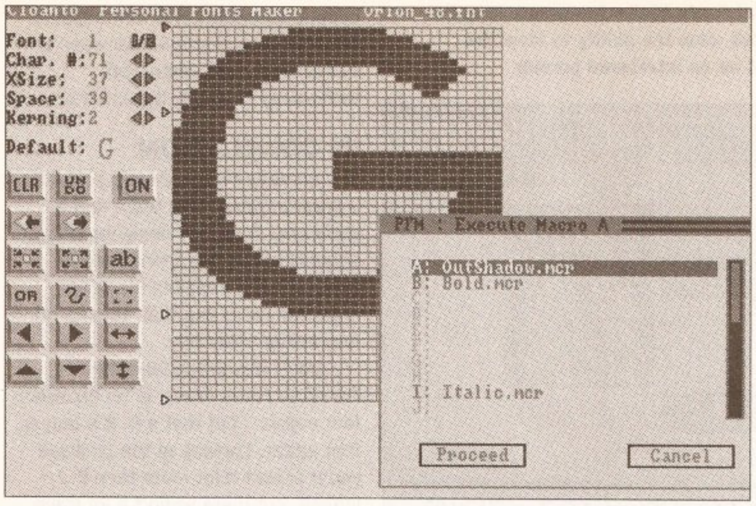
ALL PRODUCTS SUBJECT TO AVAILABILITY

Access VISA

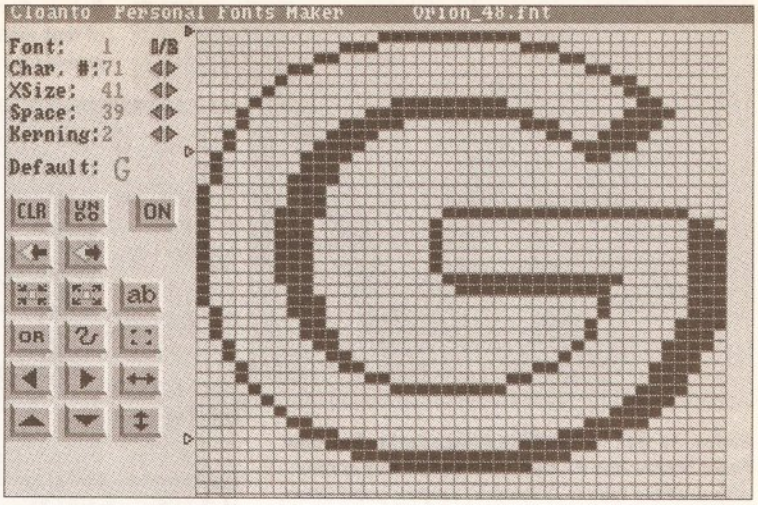
ALL PRICES INCLUDE VAT. PLEASE ADD £2.99 POSTAGE AND PACKING FOR DISKS + BOXES £3.99 FOR PAPER. E.O.E.

Hotline Number 0345 045 455

1st Floor, I-Mex Business Park, 42 Flaxley Road, Stechford, Birmingham B33 9HL



Macros help you quickly turn an existing font into something new. Here we are ready to turn the letter 'G' into an Outline version...



...and here is the result. Macros can be executed either on single letters or on whole fonts – changing all the characters at once.

Fun with fonts

Paul Ockenden looks at an Italian font editor package. Is it the best thing since sliced spaghetti, or complete overkill?

I'd like you all to dig out a copy of the Extras disk and have a quick play with a small program you'll find tucked away on there somewhere called *Fed*. This is Commodore's attempt at a font editor. At first sight it probably seems cute, but try doing something useful with it, like designing a 72-point script font, and you'll quickly discover that *Fed* is little more than a multi-storey compost heap.

But now an Italian software house by the name of Cloanto has come to our rescue with *Personal Fonts Maker*. (Cloanto seems to like calling its package *PFM*, but *Personal Finance Manager* grabbed that one for itself at least a year ago.) The Cloanto program stands head and shoulders above Commodore's pathetic offering – but then again, I suppose that for £70 it ought to.

By the size of the package you'd never believe that *Personal Fonts Maker* was a mere font editor – it comes with a 320-page ring-bound manual, plus three disks of programs, fonts and utilities. I know that sounds incredible, but it's true.

You see, there's one word which sums up *Personal Fonts Maker* more than any other: overkill.

> **"If you're fed up with not being able to edit Amiga fonts, this new package could be just the thing you've been waiting for."**
> **Paul Ockenden**

Let's take an example. *Personal Fonts Maker* has its own macro language. From this language you can do things like change your font into outline format, or stretch, shrink and distort your fonts. There are a total of 61 commands in the macro programming language. See what I mean about overkill?

To be fair to the package, it does have features far above and beyond those of Commodore's *Fed*. For example, with a bit of mucking around in FFDL – yet more overkill, this time a Font Format Description Language – you can download your newly created fonts to a printer, and thus use them from your favourite word processor or text editor. There are various utility programs provided, including a rather neat one which allows you to modify the Commodore-supplied printer drivers in various strange ways.

If you use the Workbench, you'll find that the program requires at least 1Mb of RAM. It will run on a 512K Amiga, but only if it has the machine to itself. It works fine from a hard disk (there is an install script provided) and it is not copy-protected in any way. Given enough RAM it multitasks without problem.

In use, the program works very much like a basic paint package. A drawing grid is provided, with a

continued on page 44

THE MACRO LANGUAGE AND ITS USES

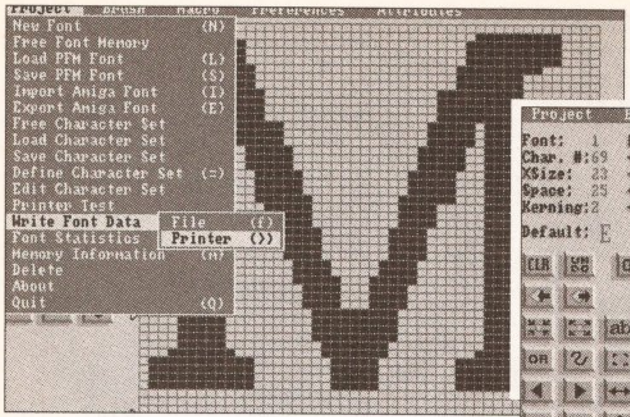
The macro language allows almost any user interface event to be recorded and played back later, but by entering the macro commands directly rather than in record mode you will find that there is much more flexibility available.

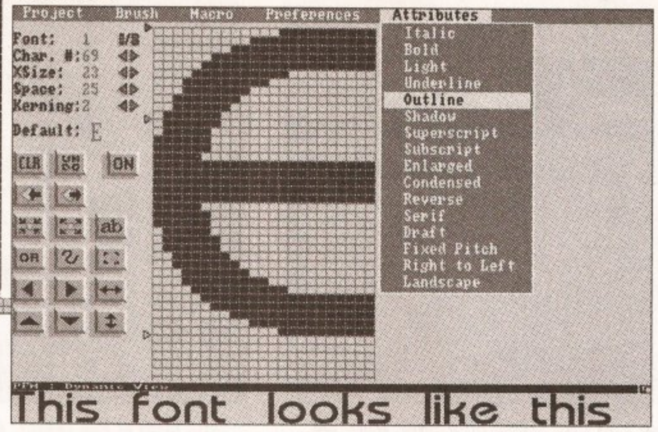
Take a look at the following macro, for instance:

```
DOTM      - Set DOT mode
MKB1      - Brush def'n mode on
ORM1      - Set OR mode
BHUL      - Brush handle uppr left
BRST 0    - Brush resize stretch 0
LBTD 0 0  - Press left mouse button in ↲
            square 0,0
MOVE M M  - Position to Max,Max
LBTU M M  - Release left mouse button in ↲
            square Max,Max
CRON      - Set character ON
XSZ+      - Increase X dimension by 1 pixel
XSZ+      - And again
CLRC      - Erase the character
LBTD 1 0  - Press left button in square 1,0
LBTR 1 0  - And release it
LBTD 1 2  - Same in Square 1,2
LBTR 1,2  -
LBTD 0,1  - And 0,1
LBTR 0,1  -
LBTD 2,1  - And finally in 2,1
LBTR 2,1  -
RBTD 1,1  - Right button in square 1,1
RBTR 1,1  - And release it
ORM0      - Clear OR mode
DOTM      - And back to DOT mode
```

This macro turns a character into an outline version of itself. It does it by selecting the character as a brush, and then pasting it four times, offset from the original character by one pixel in both x and y directions. Finally, it re-draws the original character back in the middle in XOR mode. The screengrabs at the top of the page show the effect produced.

You can view macros either by mnemonics (as shown in the listing), or in a verbose English format similar to the appended comments. Macros can be played back in normal or single-step mode, and can be applied to any range of characters specified. There are several example macros supplied with the package.





Below: *Personal Fonts Maker* features a long list of font attributes, plus the ability to view the actual-size font on an interlaced screen.

Above: As well as handling Amiga fonts, *Personal Fonts Maker* has its own font format and comes with a whole bunch of fonts in varying point sizes.

continued from page 43

toolbox of various gadgets to perform magic on your characters.

Pixel and Brush drawing modes are supported, along with various other features that make font designing easier – things like horizontal and vertical flips, shifts, and the ever essential Undo. The menus are arranged logically, and contain all sorts of goodies for playing with the fonts and playing with the user interface. As I've hinted above, this user interface is really very good – I'd go so far as to say superb – so the only limiting factor in designing a font is your imagination and artistic ability.

SLICK AND SMOOTH

The package is slick and smooth. After a short time I found I didn't notice the user interface at all – everything is laid out in such a logical manner that there's no hunting around looking for a particular feature.

The whole thing is... well... intuitive. The various drawing tools are easy to use, and the file requesters are excellent. I wish more Amiga applications were such a pleasure to work with.

The program supports its own internal preferences format which, as you would probably expect by now, allows you to customise just about every feature from the various default directories to the colour bias of the screen. The preferences file is saved in ASCII format, so it can be modified using your favourite editor – although most of the options can be set via the user interface as well.

When loading or saving a preferences file, there is full control over which of the various items are overwritten or saved. So, for example, you could load just the colour scheme and audio parameters from one file, and the font details from another.

If your printer supports downloaded, or 'soft' fonts (many do), then with the help of *Personal Fonts Maker* you will be able to download Amiga- and *PFM*-format fonts, and then use them from any application.

If you have an obscure printer, then you will need to play with the FFDL parameters to set things like the byte order of downloaded fonts, or the escape sequences needed to switch character sets – be sure to have your printer manual handy. Luckily there are printer definition files supplied for many of the more commonly used printers, and I had no trouble downloading fonts to my laser printer either in LaserJet or Epson emulation modes.

A separately supplied utility, *PDM* (*Printer Driver Modifier*), allows you to change the various codes sent to your printer by the preferences printer driver. For example, if you think your printer is being sent the wrong code to go into 'perforation skip' mode, you can examine and change that code. You can also change the mapping of the characters in the upper half of the character set, so you could move the pound sign, for example.

I mentioned that Cloanto is an Italian software house. To be honest, if it wasn't for the Italian-sounding name and the address at the front of the manual I'd never have guessed, as both the manual and the program itself use fluent and lucid English.

The manual itself is in A5 ring-bound format and covers absolutely every aspect of the program in immense detail, right down to the format details of the IFF chunks used for the internal *PFM*-format font files. It also contains a fairly good 'Amiga For Beginners' section, a 'Typesetting For Beginners' section and a simple tutorial. My only real complaint is that the tutorial hardly scratches the surface of the product.

PROBLEMS

I've always thought that the expression was 'love it or hate it'. Several weeks of playing with *Personal Fonts Maker* has convinced me that the correct version of this expression should be 'love it *and* hate it'. I've dealt with some of the loves, now let's get a couple of the major hates out of the way.

First, the most frequent problem I had with the package was that it kept crashing my machine. Nothing as polite as a Guru or Task Failed requester, just a completely blank screen which required a re-boot. Interestingly, there's a sticker on the front of the package saying that the product is fully AmigaDOS 2.0-compatible, and yet when I switched back to 1.3 towards the end of the review period I found that the program bombed out on me a little less – although it still wasn't perfect. Maybe it was my hardware configuration – a B2000 completely stuffed full of goodies – but I've never had anything else crash on me in the same manner – or with the same frequency – as *Personal Fonts Maker* did.

My other major complaint is one that goes right back to the fundamental design roots of the program, and that is that it stores its font data in a bitmapped format. The program can load and save its data in both an internal *PFM* format and as a normal Amiga font – both of which are bitmapped; I can't understand why the authors included the internal format as it seems to offer no great benefit over the standard Amiga font format.

The big problem with bitmapped fonts is that if you enlarge the characters they become very jagged, and if you reduce them too much they tend to look awful.

The solution, of course, is to use vectored fonts. There are at least five vector font formats currently supported by various Amiga programs – PostScript types 1 and 3, MetaFont, Agfa Compugraphic and *PageStream*'s own format – and vector fonts can easily be rendered to produce bitmapped Amiga fonts. In fact, the latest version of AmigaDOS 2.0 is rumoured to include Compugraphic font support. Why *Personal Fonts Maker* wasn't designed around vector font technology is simply beyond me.

IN CONCLUSION

In summary, I think there's probably a great programming team and a great user interface designer sitting somewhere in Italy trying hard to come up with sensible ideas for applications to use their talents on. And failing miserably.

Don't misunderstand me – *Personal Fonts Maker* is an excellent font editor... but that's it. It's only a font editor. Looking at the package you'd expect a lot more from it. I looked, but there wasn't a lot there.

If you are seriously into designing fonts and you have £70 burning a hole in your pocket then go out and buy this package. If you are a little poorer, then persevere with *Fed* or check out some of the alternative public domain font editors available on various Fish disks.

I'm certain we haven't seen the last of the guys from Cloanto. If they could come up with a spreadsheet based around the user interface techniques used in *Personal Fonts Maker*, for example, they would be on to a sure-fire winner. AS

SHOPPING LIST

Personal Fonts Maker..........£69.95
(Price subject to confirmation)

Distributed in the UK by
HB Marketing Ltd,
Unit 3, Poyle 14,
Newlands Drive,
Colnbrook,
Berkshire SL3 0DX
☎ 0753 686000

CHECKOUT
PERSONAL FONTS MAKER

Ease of Use ●●●●○
Slick and smooth.

Speed ●●●○○
Some of the program's features take a while to work.

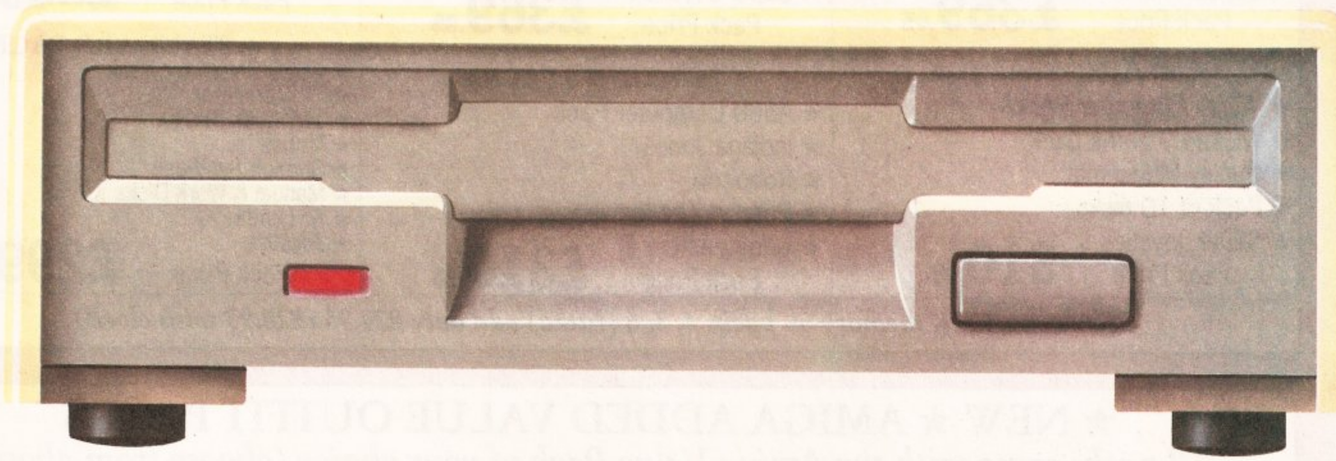
Features ●●●○○
In reality, the program doesn't actually do a lot.

Documentation ●●●●●
An excellent manual.

Price Value ●●○○○
At £69.95, it's somewhat overpriced for what it does.

Overall rating ●●●○○
Does its job well – it's just a shame that its job isn't particularly spectacular.

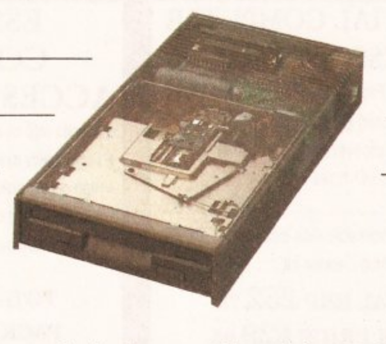
Where you can stick it.



Viruses, disk swapping, clicking drives, disks which won't back up. Is there no end to the whingeing of the Amiga user?

At Power, we want to tell you just where you can stick your disks and worries. In fact we will show you. The slot in this picture belongs to our PC880B, the first intelligent disk drive. Insert a disk.

Now you can back up at lightning speeds using the inbuilt Blitz Amiga hardware, with free software, (even if the disk is Atari or PC) and if your computer has a virus the PC880B will stop it being written to the bootblock of any of your drives, though you can still save files as normal.



When you do not want these features, switch them off and the PC880B will sit quietly, without clicking, pretending to be simply an extra drive.

The PC880B, the only drive to introduce Blitz Amiga, the power anti-click device and to combat viruses, is only available direct from Power, priced at just £65.

We have noticed how pricey unintelligent drives are. Perhaps, its your turn to tell people where to stick it.

£65 **Now available as a dual drive with the same features, and built-in power supply £110**



Only available at

POWER COMPUTING LTD
Unit 8 Railton Road Woburn Road Industrial Estate Kempston Bedford MK42 7PN
Tel: 0234 843388 Fax: 0234 840234

Price includes VAT and is subject to change. Specifications are subject to change without notice.

FROM THE POWER HOUSE

1.5Mb A500 Ram expansion card	£79..00
Blitz with PC880 drive	£65.00
Blitz Turbo	£19.95
A500 anti-click board	£15.00
Power mouse	£14.95
Slimline hard disk 40Mb	£299.00
Amiga 2000 internal drive kit	£46.95
A500 internal floppy drive	£46.95

AMIGA 1/2 MEG UPGRADE BOARD

★ Uses latest 4 chip design
★ Memory on/off switch
★ Option of battery backed clock
★ Full 12 month guarantee
★ New super low price

£24.95

Clock version £29.95

DISK DRIVE STARTER KIT

★ PC880 3.5" High Quality Disk Drive.........£89.99
(Features anti-click, on/off, superslim design)
★ Ten 3.5" DS/DD disks with labels ....RRP £9.99
★ 40 Capacity lockable disk box ....RRP £9.99
★ 3.5" Disk drive cleaner kit..................RRP £9.99

TOTAL RRP £119.96

Starter Kit Price £59.99

STAR PRINTERS

LC10 Mono
9 Pin Dot Matrix 144/34cps............£149.95

LC200 Colour
9 Pin, 180/45 cps, 16K Buffer.........£199.95

LC24-200 Mono
24 Pin Dot Matrix, 200/67cps..........£239.95

LC24-200 Colour
24 Pin, 200/67 cps, 30K Buffer.......£289.95

PRINTER ACCESSORY PACK

Only available when purchased with a printer.

★ Parallel printer cable - RRP £14.95
★ 200 sheets listing paper - RRP £6.95
★ Quality tailored dust cover - RRP £12.95

TOTAL RRP £34.85

PACK PRICE £9.95

with printer stand

£14.95

PRICES SMASHED

	RRP	OUR PRICE
Music X V1.1	£149.95	£69.95
Music X Junior	£79.95	£39.95
Midi Interface (In-thru-out-out) with lead	£29.95	£17.99

ESSENTIAL ACCESSORIES

Disks

Pack of 10 high quality 3.5" DS/DD	£4.99
Box of 10 branded TDK 3.5" DS/DD	£7.99
Box of 50 3.5" DS/DD with labels	£18.99
Box of 100 3.5" DS/DD with labels	£35.99
Box of 250 3.5" DS/DD with labels	£79.99
3.5" disk drive cleaning kit	£3.99

Disk Boxes

3.5" 10 capacity Ryford box	£1.49
3.5" 40 capacity lockable box	£4.50
3.5" 80 capacity lockable box	£5.95
3.5" 80 capacity Van 3 (slim design)	£7.95

Mouse

High quality mousepad	£2.99
Mouse/joystick extension leads	£5.99

Dustcovers

PVC quality covers for computer/printer	£5.99
High quality solid Perspex dustcover	£9.99

MICROSWITCH JOYSTICKS

The only joysticks worth buying, full 1 year guarantee!

QUICKJOY III SUPERCHARGER
Two fire buttons, Auto-fire, Six micro-switches........£8.99

QUICKSHOT TURBO
Two fire buttons, Auto-fire, six micro-switches..£9.99

QUICKJOY VI JETFIGHTER
Two fire buttons, Autofire with fast/slow mode, 6 m/s........£12.99

COMPETITION PRO 5000
Two fire buttons, steel shaft, Autofire, m/s....£12.99

ZIPSTICK AUTOFIRE
Two fire buttons, steel shaft, Autofire, m/s....£13.99

STINGRAY AUTOFIRE
Direct replacement for Konix Navigator.........£14.99

QUICKJOY V SUPERBOARD
Six fire buttons, Autofire, stopwatch, Ten m/s........£16.99

QUICKJOY TOPSTAR - *Highly recommended*
Two fire buttons, A/f slow motion, 6 m/s, see through body........£19.99

QUICKJOY MEGABOARD
Four fire buttons, 8 m/s, A/f slow motion, stop watch, countdown........£23.99

TELESALES ORDER LINE (MON-FRI) 0480 403222/(SAT) 0480 403304

DOW

HOW TO ORDER

Access VISA

BY PHONE

Simply call our head office quoting your Access/Visa number on

Mon-Fri 0480 403222
Sat 0480 403304

By personally calling at our St Neots or Hertford Shop

ST NEOTS	HERTFORD
6 Priory Mall, St Neots, Cambs Tel: 0480 403304	49 Railway St. Warren Place Hertford, Herts. Tel: 0992 554469

BY POST

Make cheques, building society drafts or postal orders payable to:

Dow Computers
Please allow time for cheque clearance

DELIVERY (UK Mainland, most areas)

Please add £6 courier delivery for orders over £100, add £2 p&p for orders under.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

GOLD CLUB SERVICE

★ 7 day money back guarantee if not completely satisfied
★ 30 day exchange for new policy should a fault occur
★ 1 year guarantee giving FREE collection and delivery service should a fault occur
★ Exclusive gold card with personal membership number entitling you to special offers
★ All this for a nominal £10 per item over £100

PLATINUM CARD SERVICE

★ All the benefits of the successful gold card service (above) plus the following

→ Extended 2 year guarantee from date of purchase. *(Peace of mind for 2 years)*
→ Free use of loan machine if required should yours need to be repaired. *(Now you never need be without your expensive purchase)*
→ Free collection and delivery service for the full two years should a fault occur. *(Just make one simple phone call and leave the rest to us!)*
→ Exclusive platinum priviledged customer card entitling you to special offers.
→ All of these benefits for the incredible price of just £39.95 per item purchased.

N.B. In the unlikely case of shortages of identical model loan machines a suitable alternative will be offered.

WHY CHOOSE DOW?

★ **ESTABLISHED OVER 5 YEARS**
With a growing reputation for "putting the customer first". We intend to satisfy many more customers for years to come

★ **TECHNICAL SUPPORT/ON-SITE ENGINEERS**
Employing over 20 specialist staff, we are equipped to deal with the majority of queries

★ **FULL TESTING PROCEDURE**
All computer hardware is tested prior to despatch, proving Dows commitment to customer care

Prices correct at going to press but may change without notice. E&OE.

COMMODORE 1084S STEREO MONITOR
Including FREE lead
ONLY £229.00

PHILIPS 8833 MK II STEREO MONITOR
Including Free Lead
ONLY £229.00

16 BIT CENTRE
COMPUTERS - PERIPHERALS - ACCESSORIES

CDTV now in stock

Open Monday to Saturday 9am -6pm
Callers and Mail Order welcome
Easy parking

GVP SERIES II 52M A500 Hard Drive with space for 8Mb of RAM
ONLY £499.00

AT ONCE AMIGA
PC 286 AT EMULATOR FOR THE A500
ONLY £169.00

AMIGA PACKS

SCREEN GEMS PACK, inc. Shadow / Beast II, Back/Future II, Nightbreed, Days of Thunder, Dpaint II	£359.00
AMIGA A500, mouse, modulator, power supply, Workbench 1.3, Basic Tutorial and manuals	£309.00
CARTOON CLASSICS inc: 1Mb Ram, Lemmings, Simpsons, Captain Planet, Deluxe Paint 3	£369.00
CLASS OF THE 90'S FIRST STEPS, inc. Extra 512K, Pr-Write, Info File, Dpaint + Dprint II etc	£515.00
CLASS OF THE 90'S, inc. Extra 512K, Publishers Choice, MaxiPlan, BBC Emulator, Midi Int. etc	£515.00
AMIGA CREATIVITY PACK, with Word Processor, Music & Paint packages, 3 games + Tutorial Video	£359.00

All Amiga A500's supplied with mouse, modulator, manuals, workbench, Basic + Tutorial

AMIGA A500 FUN PACK

Amiga A500, Mouse, Modulator, Manuals, Basic, Workbench, Tutorial, Joystick, Disk Box, 10 Blank Disks, Dust Cover, Dpaint III, PLUS 13 GREAT GAMES Lemmings, Simpsons, Captain Planet, Star Wars, Toobin, Barbarian II, Licence to Kill - James Bond Game, Running Man - With Schwarzenegger, APB, Xybots, Dragon Spirit, Hard Drivin, Voyager, 1 Meg of Ram

ONLY £399.00

AMIGA A500 MAX PACK

Amiga A500, Mouse, Modulator, Manuals, Basic, Workbench, Tutorial, Joystick, Disk Box, 10 Blank Disks, Dust Cover, Dpaint II, PLUS 10 GREAT GAMES Star Wars, Toobin, Barbarian II, Licence to Kill - James Bond Game, Running Man - With Schwarzenegger, APB, Xybots, Dragon Spirit, Hard Drivin, Voyager

ONLY £359.00   1 MEG VERSION £389.00

SOFTWARE AND DISKS

3D PROFESSIONAL	£209.00	PIXEL 3D	£49.00
AMOS + EXTRAS DISK	£32.00	DELUXE PAINT III	£29.00
BROADCAST TITLER II	£169.00	PRO-WRITE V3.1	£85.00
TV SHOW	£55.00	EXCELLENCE V2	£89.00
DIGIVIEW GOLD V4	£95.00	TITLE PAGE	£109.00
LATTICE C V5.1	£149.00	PROFESSIONAL PAGE V2	£169.00
PAGESETTER V2, DTP	£47.00	VIDEO EFFECTS 3D	£109.00
PAGESTREAM, New Version 2.1	£129.00	X-CAD DESIGNER (1 Meg)	£69.00
PAGESTREAM FONTS	£49.00	X-CAD PROFESSIONAL	£129.00
TV TEXT PROFESSIONAL	£79.00	WORDWORTH	£85.00

CROSS-DOS, Multi-format file transfer	£23.00
HITACHI 720 VIDEO CAMERA. Ideal for DigiView	£199.00
PEN PAL, Excellent Word Processor (1 Meg)	£55.00
IMAGINE 3D Animation & Rendering software	£149.00
ART DEPARTMENT PROFESSIONAL	£119.00
ALL IN ONE, Art package, Word Pro + Music package	£49.00
VIDEO EASE, Video wipes, titling package	£35.00
PHOTON PAINT II, HAM Art + Animation	£25.00
AMOS COMPILER	£23.00
THE WORKS PLATINUM. Integrated package	£62.00
GOLD DISK OFFICE	£105.00
DOS 2 DOS Multi-format file transfer	£33.00
WALT DISNEY ANIMATION STUDIO (1 Meg)	£69.00
SPECTRA COLOUR	£55.00
X-UTILITIES	£34.00

HARDWARE

COMMODORE A590 20MB Hard Disk, Unpopulated	£285.00
COMMODORE A590 20mb Hard Disk + 2m RAM	£339.00
FRAME GRABBER PAL	£449.00
RENDALE 8802 Genlock, A500/B2000	£185.00
AUDIO ENGINEER Sampling hardware/software	£169.00
SOPHUS S5 Professional Stereo Sampler	£49.00
KCS POWERBOARD, PC Emulation (A500) with MS DOS	£215.00
AMIGA compatible external disk drive, switch plus thru port	£57.50
GVP 52MB SCSI hard drive & 8M RAM Board for A500	£499.00
GVP 52 MEG SCSI Drive plus 8 Meg Ramboard for 1500/2000	£419.00
GOLDEN IMAGE HAND SCANNER with software plus Photon Paint	£169.00
NAKSHA CLONE MOUSE	£19.95

PRINTERS

STAR LC-10 MONO PRINTER inc. Lead	£159.00
STAR LC-200 COLOUR PRINTER inc. Lead	£209.00
STAR LC-24/200 MONO PRINTER inc. Lead	£249.00
STAR LC-24/200 COLOUR PRINTER inc. Lead	£297.00
CITIZEN SWIFT 24 MONO inc. Lead	£279.00
CITIZEN SWIFT 24 COLOUR inc. Lead	£275.00
CITIZEN 124D 24 Pin Mono inc. Lead	£195.00
CITIZEN 120D Plus, 9 Pin Mono inc. Lead	£139.00
CITIZEN SWIFT 9 COLOUR inc. Lead	£179.00
CANON BJ10E bubble jet inc. Lead	£255.00

AMIGA A1500

The A1500 inc. Philips 8833 or CBM 1084S monitor, Twin Drive, Dpaint3, The Works Plat., +4 Games, **ONLY £859.00**

AMIGA A500 part exchange available - please phone

AMIGA MEMORY

SUPRA RX500 8M Board for A500 inc 1M	£125.00
SUPRA RX500 8M Board for A500 inc 2M	£159.00
B2000/1500 Microbotics 8M Ram Board + 2 Meg RAM	£159.00
Extra 2 Meg Ram for above board	£75.00
A500 TARGET 512K Ram, With Clock + Switch	£29.00

SUPRA/BAUD BANDIT MODEMS

Hayes Compat. Auto-dial/answer, V21, 22, 22bis **£124.00** Supra 2400 Plus, MNP5 + V42 Bis (speeds up to 9600) **£189.00**
As above but includes MNP5 error correction **£149.00**. New Supra 9600 Modem (speeds up to 38000) **£399.00**

HOW TO ORDER:
Either call our number below with your credit card details, or send a cheque/PO or credit card number and expiry date to our address. Make cheques payable to THE 16 BIT CENTRE
Prices subject to change without notification.

All prices include VAT + Courier Service

16 BIT CENTRE

Units 15-17,
Lancashire Fittings Science Village
Claro Road, Harrogate HG1 4AF

Tel (0423) 531822/526322

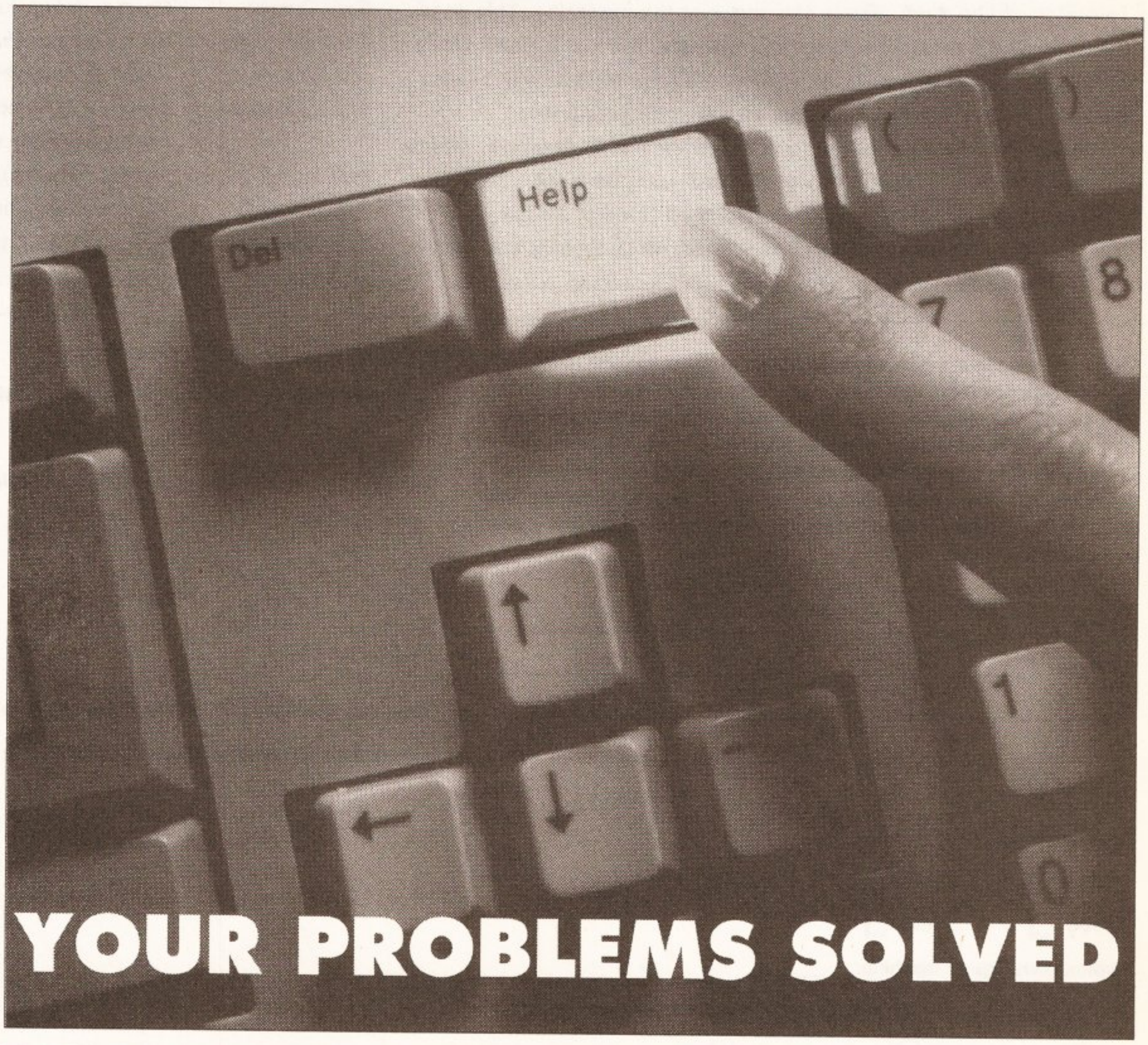
EXTENDED WARRANTY AND MAINTENANCE CONTRACTS AVAILABLE ON ALL ITEMS. PLEASE CALL FOR FURTHER DETAILS

Access
VISA

CONTENTS AT-A-GLANCE

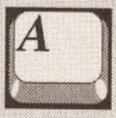
OUR EXPERTS TACKLE YOUR REAL-LIFE PROBLEMS

AMIGA ANSWERS



SO WHAT DO ALL THOSE ICONS MEAN?


Beginners: this icon will appear next to any questions which are 'basic' in content.


General: this icon is used for any general Amiga-related queries.


Caution: be sure that you fully understand the answer before trying it out.

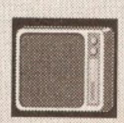

Danger: the answer to this question could well invalidate your warranty – or you!


Hardware: this icon is used to denote questions relating to general hardware.


Buying advice: we use this icon if the question asks us for buying advice.


Printers: this icon denotes a query about printers, printer drivers and so on.


Technical: any queries about programming will have this icon next to them.


Video: this icon relates to any query about using your Amiga with video hardware.


Music: this icon is for questions about MIDI, sampling, synthesizers and so on.


Programs: any program-specific queries have this icon next to them.


Comms: if your question relates to comms, this is the icon that we'll use.

WHATEVER YOUR PROBLEM WITH THE AMIGA, WE ARE HERE TO SOLVE IT

That's the task we have set ourselves in giving you the best possible support for your Amiga. We are confident that our experts can cope with any technical questions you can throw at them. If they don't already know the answer to your problem, they will find it out for you.

We are prepared to deal with any problem you have with the Amiga, from general enquiries about AmigaDOS or Workbench, through questions about specific pieces of software and hardware, to advice on what you need to buy to do a particular task. If it's to do with the Amiga, we will help out. What we cannot do is offer this service over the telephone – do not phone us with your enquiries, but write to us at the address below.

We also cannot enter into personal correspondence – all enquiries will be dealt with in the pages of the magazine. This does mean a bit of a delay in solving your problem, but you'll just have to be a little patient and wait for it to appear in print. You won't get a personal reply even if you enclose an SAE with your letter.

Send your question on the form below to: Amiga Answers, *Amiga Shopper*, Beauford Court, 30 Monmouth Street, Bath BA1 2BW.

The Amiga Answers panel consists of all three of *Amiga Shopper*'s consultant editors – Jeff Walker, Mark Smiddy and Phil South – and, of course, our resident technical editor Cliff Ramshaw. We will also be calling on the services of all our other contributors, so you won't be able to catch us napping whatever the subject of your query.

Each panelist will be dealing with queries in their own specialist area(s) so it would help us greatly if, when writing, you label your query envelope with the name of the expert who can solve your particular problem. Below is a list of their areas of expertise. It's a list that we will add to and update every month, so you will know who to write to about any subjects not mentioned here.

Gary Whiteley –	Video
Stewart Russell –	Comms, CAD
Paul Overaa –	Programming, music
Mick Draycott –	Hardware, programming, MIDI
Jeff Walker –	Desktop publishing, programming
Mark Smiddy –	AmigaDOS, business, CDTV, hardware projects, hard and floppy disk drives
Phil South –	Public domain, graphics, AMOS
Jolyon Ralph –	Programming, hardware
Cliff Ramshaw –	The really hard stuff that no-one else can answer

If you send in a question for the Amiga Answers experts, please fill in and include the form below (or a photocopy if you don't want to cut up your magazine). And please also make sure that you include all the relevant details – version numbers of software and so on – so that we have the best chance of helping you. Send your form and question to: Amiga Answers, *Amiga Shopper*, 30 Monmouth Street, Bath BA1 2BW. Sorry, but we cannot personally reply to any questions – even if you include an SAE.

Name: ____________________

Address: ____________________

____

____

Your machine:

A500 ☐ **A1000** ☐ **A1500** ☐

A2000 ☐ **A3000** ☐

Approximate age of machine: __________

Kickstart version (displayed at the 'insert Workbench' prompt)

1.2 ☐ **1.3** ☐ **2.x** ☐

Workbench revision (written on the Workbench disk)

1.2 ☐ **1.3** ☐ **1.3.2** ☐ **2.x** ☐

PCB revision (if known). Do not take you machine apart just to look for this! __________

Total memory fitted (see AVAIL in Shell for 1.3 Workbench) ________

Chip memory available (see AVAIL in Shell) ____________

Agnus chip (if known) ____________

Extra drive #1 (3.5"/5.25") as DF__: Manufacturer ____________

Extra drive #2 (3.5"/5.25") as DF__: Manufacturer ____________

Hard disk: ____Mb as DH__: Manufacturer ____________________

Extra RAM fitted – type, size in Mb and manufacturer ____________

Details of any other hardware which could help us to answer your question:

Now, use this space to describe your problem, including as much relevant information as possible. Please continue on a separate sheet if necessary.

AS 7

OVERSCAN MISSING



After several years of using Amigas, first for word processing, DTP and spreadsheets, I have recently become involved in using the Amiga for its highly-acclaimed graphics capabilities.

However, I seem to have stumbled across a very annoying flaw in the graphics handling of the machine. When I render pictures with *Real 3D* in high-res, 16-colour PAL overscan they seem to be displayed as NTSC images (that is, there is a blank space at the bottom of the screen where picture information should be).

Since then I have also found this same problem with some other graphics programs. What's up, Doc?

M C Gagen
King's Lynn
Norfolk

The problem is not really to do with the software you are using. It's actually an Amiga operating system shortcoming, and can easily be fixed by first adding a public domain program called *PatchMrg* to the C: directory of your boot disk and then by using a text editor such as *Ed* to add a line like the following to your startup-sequence:

```
c:PatchMrg >NIL:
```

After re-booting with the new startup-sequence all should then be clear, bright and full-screen. Don't forget that you should work on a backup of your boot disk.

If you can't easily find *PatchMrg*, it is included in the c: directory of *Scala* (from Digital Vision) and I've confirmed with the company that it is actually PD. ***GW***

ORGANISE A DATABASE



As I read through a computer magazine, I grade each article I find of interest from 1 to 10. I also make page notes and other information, the idea being to create an index of all the articles in each magazine.

I tried to create a database using *Scribble!* to hold these indexes, but I found that I had to open a new database for each magazine. When I open the database I bring up the old one, click on 'Copy Design', name it with the new issue of the magazine and get the message "DB has been created" but if I close this database and then try to reopen it I get the message "Error reading file".

Where am I going wrong? Is it possible for me to open just one database with all my magazine articles in it and, if this is so, how can I save myself a great deal of repeat typing?

H M Joel

First, I hope that you are referring to the database part of the *Scribble!* package, *Organize!*. *Scribble!* itself is a word processor and completely unsuitable for the use you intend. If we assume that you are using the database, then you have not grasped the basics of storing data.

As you have suggested at the end of your letter, one database is sufficient for your needs. Fields (areas for input) are defined according to the data you wish to store. Enter the database and select 'New' from the Project menu. Then select the 'Add' button and start defining the database fields. The first requirement is to give the field a name. This is equivalent to the question prompt. For instance, if you want the first field to record the magazine name, then call it "Magazine". This would be a text field because we will not be performing any mathematical calculations upon the whatever is typed in to this field.

For example, you could set up field details such as:

Field Name	Width	Type
Magazine	20	Text
Issue	2	Text
Article	20	Text
Page	3	Text

Note that although some of the responses to the prompts will require numeric input, the field is still defined as a text field. This is because we will not need to perform numerical calculations on them.

Once all the fields have been added, we then save the database, which stores the information on to disk. Note that this does not record any information other than data about the structure of the fields. Give the database a name, something like "Magazine.db" should do, and then click on Resume. We now have to open our database to enter the information we wish to store in it.

Select Open from the Project menu and click on the Magazine.db file. Now you can input information into the database, filling each field as you go. As for repeat typing, just copy one record (the entire set of fields for each entry) to another with the Copy command and change whatever bits you find necessary. ***MD***

JARGON BUSTING

Bitplane/bitmap – A bitplane is an area of memory where every binary bit corresponds to a pixel on the screen. One bitplane represents a monochrome image, several can be overlaid to represent a colour or grey scale image.

Database – A program that enables information to be stored and retrieved in a structured manner. Information can be categorised according to a user's preference, and searched for according to user-specified criteria.

Intuition – The part of the Amiga's operating system concerned with window handling, menus and so forth. It interprets user input from the mouse and sends information to the relevant windows via the Intuition Direct Communication Message Ports.

NTSC – National Television Standards Committee. This is the name for the TV colour-coding system used in the USA and some other countries. The standard has 525 horizontal lines, running at 60 fields and 30 frames/second.

Overscan – A way of achieving a resolution higher than the Amiga's standard by utilising the border areas of the screen which are normally left blank.

PAL – The other main TV colour coding system which is in use around the world and was developed in Britain. PAL refers to Phase Alternate Line. In fact, there are several hybrid PAL systems in use, all of which are slightly different.

SCREEN REGENERATION



I am writing an Intuition-based graphical package in C. Each change to the screen requires the whole image to be regenerated from scratch. This is where my problem lies: the regeneration takes too long for the package to be remotely usable.

I then had the idea of introducing a primitive form of double-buffering, using two windows. All regeneration would be done in the back window, then when it was finished the back window would be brought to the front and the cycle would repeat. I don't know if this works because since making the above radical changes to my program it Gurus before I get a chance to try it out. Obviously I have introduced a major bug here, but it is rather elusive.

Is the above method of double-buffering going to give me a speedier update, is my method feasible or is there a better way of achieving a faster update?

Lee Allen
Maidenhead
Berkshire

Your basic idea of switching between two Intuition displays is OK, but you've given so little detail about the code you've written that it is difficult to tell where your current problems might lie. First off, are you using SuperBitMap windows (which have their own display memory)? If not, and you have opened two full-sized windows of other types in the same Intuition screen, then you are effectively attempting the impossible task of trying to double-buffer with only one set of bitplanes available.

Swapping at the Intuition level is certainly the easiest thing to try first, but my choice if I were looking to implement such a scheme would be to open two custom Intuition screens and then open a full-size borderless backdrop window in each of them. That approach will provide full Intuition object/message support, and still let you work with the display memory in any way that you see fit. I'd then swap screens (rather than windows) using ScreenToFront(), combined with WaitTOF() to sync the display changes.

You're not going to know whether this sort of approach would be satisfactory for your application until it is up and running. Double-buffering buys you a bit more graphic generation time, but basically the real benefit is that the intermediate drawing operations are hidden so the end result is smoother animation. Your problem, as I'm sure you already know, is that of generating your graphics within the frame time available – so your coding efforts need to be concentrated in the direction of increasing the speed of your drawing/update routines. The conventional Amiga double-buffering technique uses two sets of bitplanes (together with the BitMap structures and associated copper lists and so on). You can find the full details in the Addison-Wesley *Libraries and Devices ROM Kernel Manual*.

Incidentally, have you checked the Guru number when your program crashes? It might through some light on your current problem! ***PAO***

continued on page 52

continued from page 51

SERIAL LINKERS



I've got an Amiga 2000 and a 500 currently linked using Parnet. All I can manage is device sharing; I can't take over one machine from the other. Is there any other networking system I can use?

Also, I would like to use *RomWack* via the serial port (to debug on one and press RMB when the other Gurus). What do I connect to what? I think it's a normal null modem lead:

Pin 7 —— System Ground — Pin 7
Pin 2 (TXD) ———— (RXD) Pin 3
Pin 3 (RXD) ———— (TXD) Pin 2

Is this correct?

Can I use the serial connection to run tasks on the other machine – that is, use one machine as a terminal of the other?

Also, the serial cable will have to be 10 metres long. Will I get any trouble with data loss? (My parallel cable is 10m long and working OK, but can they both be plugged in at the same time? I think there may be some trouble with feedback or interference.) Bear in mind that I want to connect a T-switch to my serial port – one when I want to use the printer and the other to connect to the remote computer.

Nick Taylor
Sunderland
Tyne and Wear

Parnet can only share devices, and does not support remote processes. Your null-modem cable wiring should serve, and can be used to run remote tasks by issuing 'NewShell AUX:' on one machine, and running a comms terminal at the other end. More advanced networking requires the application of serious money. (However, see the AmigaDOS column this month for details of how to create a basic two-machine network in a very low-cost way.)

Interference between the ports should only be a problem if the serial Ring Indicator line (pin 22) is connected. As this is not the case, you ought to be OK. You might get away with an unshielded cable (telephone cable is dirt cheap) but if there's a lot of electrical kit about your place, you may have to spend more on shielded cable.

I have strong reservations about using a T-switch on any computer equipment. You'll be OK if you never switch it while anything is powered up, though. ***SCR***

LISTING BREAKS

Because of the width of the magazine's columns, we occasionally have to break listings across two or more lines. Where this has occurred, and you should enter two or more lines without a [Return] between them, we have used the following symbol: ↵

HUNKY DORY



I own an Amiga A500 with a 1.5Mb memory upgrade and am a keen machine code programmer. I'm writing an assembler for my A-level project and was wondering whether you could explain in detail how the overlay hunks in a file work (I'm writing a disassembler too).

Also, I need help with how to create filled 3D graphics (especially 'doughnuts' and cubes) using assembler.

Ben Cole
Wallington
Surrey

There's no way that any of your questions can be answered in detail because the answers would fill this issue (and probably the next) from cover to cover. I can, however, point you in the right direction as far as getting some technical help goes.

First your question about overlay hunks: the idea with overlays, as I'm sure you know, is that instead of having a complete program in memory you only load a part of it and bring in additional code sections as they are needed. The original *ALINK* linker and the subsequent *BLINK* linker support an automatic overlay system which, providing it's been given the right directives, will handle the loading and unloading of overlay segments automatically.

As the first step, the programmer will create a set of source code files which are compiled/assembled as per normal to produce the appropriate object code modules. It is then up to the programmer to create a MAKE file which uses the linker's OVERLAY directive to specify the overlay tree. The output from the linker when overlaying is, as per usual, a single binary load file – *but* it consists of all the code and data sections together with information about the positions in the file of the 'nodes' of the overlay tree. At run-time, incidentally, the whole of this overlay process is transparent – an overlay supervisor handles the loading and unloading of the overlays without the program even knowing it is being done. All of the technical details you need can be found in *The AmigaDOS Manual* (Bantam Books ISBN 0 553 35403 5).

As far as the 3D graphics question is concerned, you need to get hold of information on the underlying generation/fill/surface algorithms: There are plenty of decent books around but *Fundamentals of Three Dimensional Computer Graphics* by Alan Watt (published by Addison Wesley, ISBN 0 201 15442 0) would be as good a place to start as any.

Once the various algorithms are understood, it is arguably no harder to translate them to assembler than to any other language (although it obviously takes longer). Whenever I have to tackle this type of coding I opt for using language-independent program design techniques such as the Warnier diagram.

These design techniques are easy to learn and are very powerful because they provide a basis for breaking down large problems into small but coherent portions of the problem which are then far more easily tackled.

There just isn't the space to explain how these design techniques are used with assembler, but you might be interested to know that Kuma Software is publishing a book called *Program Design on the Amiga* (ISBN 0 745 70032 2) which includes very detailed examples of these types of techniques using pseudo-code, Basic, C and 68000 assembly language. ***PAO***

JARGON BUSTING

Device – An AmigaDOS concept, creating a general means of communicating with various peripherals such as disk drives, printers, modems, the keyboard and so on.

Keymap – One of several files that are used by the Amiga to translate key presses to the relevant characters for a given country, since different countries have different layouts for their keyboards.

Linker – A program which joins together the various segments of code produced by a compiler, along with any relevant library routines, and produces a finished, executable program.

ROMwack – A debugging program retained permanently in the Amiga's ROM. It can be accessed when the machine crashes by attaching another Amiga to the serial port. Then a programmer can interrogate the crashed Amiga and hopefully discover the cause of the crash.

A KEY CHANGE



I have a problem: when I try to change the keymap to "gb" on the Setmap icon of the *Works! – Platinum* disk, it doesn't appear to have any effect. Trying a different approach, I copied the 'd' file on the Extras disk inside devs/keymaps into my DEVS:keymaps directory. However, when I did this I experienced the same problem.

In addition, how do you remove jagged lines from a *DPaint III* printout, and how to draw coloured lines on a white background.

B Blake
Hinckley
Leics.

If you take a look at the S:startup-sequence on your *Works! – Platinum* disk, you should find an entry like this:

```
SYS:System/SetMap usa0
```

The correct solution to the SetMap problem is to make sure that you have the Devs/KeyMaps/gb file on the disk, and then to alter the above line so that it reads:

```
SYS:System/SetMap gb
```

You could ue the method you were attempting if you ensure that the gb file is inside the Devs/KeyMaps directory and then select Info from the Project menu on Workbench. Type the following into the Tool Types gadget:

```
KEYMAP=gb
```

The jagged lines on your printout from *DPaint III* arise from the way picture information is stored by the program and displayed by the Amiga, and cannot be avoided.

The white background is no problem – simply change the background colour with the palette menu on *DPaint III* to white instead of black or set the printer/graphics1 element of preferences on your *DPaint* disk from Positive to Negative. ***MD***

MAMMOTH EXPANSION



I have an Amiga 1000 with 512K of RAM. It is now proving to be very limiting and I am thinking of upgrading it. My worry is

continued on page 57

You deserve the best!

Now you can get the best... with PEN PAL!

A superb package, with immense power, to fulfil all your word processing requirements and... it includes a Database! It's all so easy to use, you probably won't need to refer to the extensive 250 page manual too often.

Whilst working, you can open up to four documents simultaneously (memory permitting), search and replace; cut, copy and paste; check your spelling with a 100,000+ word dictionary. You can import your favourite IFF/HAM graphics, from programs such as DPaint II or Clip Art files in various sizes and colours. You can automatically flow text around graphics in any Workbench compatible font (there are over 200 available styles), in different sizes and colours to suit your design... even as you type. All this from a word processor and... Much, Much, More!

As you can see, this is not just any ordinary word processor! Full Page View with position, edit and creation of graphic objects. Mail Merge using the built in database and forms designer. Creation of templates for complex reports, into which the database can be merged.

Operating with 32 fields per record, and 32,000 records per database with a fast sort of 1000 records in less than 5 seconds this is a *real* database.

Pen Pal requires an Amiga 500/1500/2000 or 3000 with a minimum of 1megabyte of available memory.



Pen Pal

When...you deserve the best!

£79.95



."...its handling of graphics is unsurpassed: Pen Pal is the only program I tested that will automatically wrap text around graphics..." *Amiga World...Jul. '90*

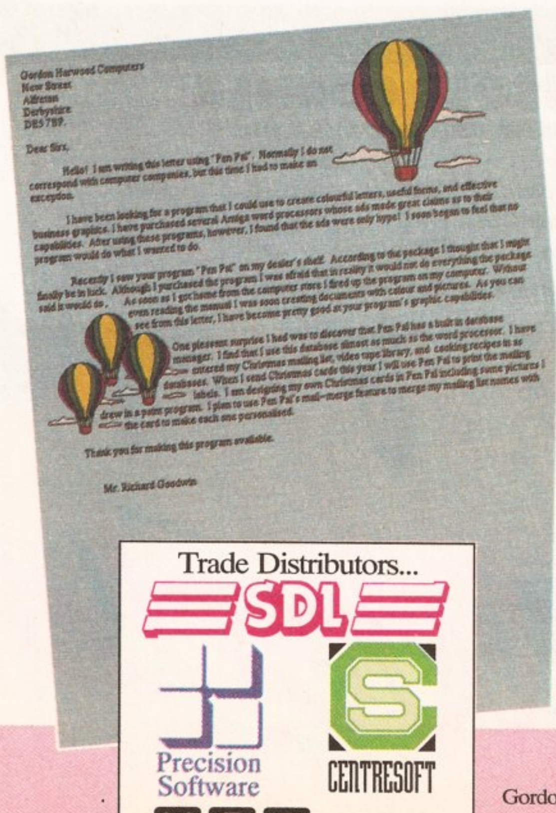
."..without beating around the bush Pen Pal is very special.." - "There is little to fault Pen Pal and it deserves to do well." *Amiga Format...Dec. '90*

"...I am extremely pleased with your product especially the Graphic Capabilities within the Word Processor. Having the Database on the same disk has made PEN PAL the best program I have..." *D.S.B., Plumstead, LONDON*

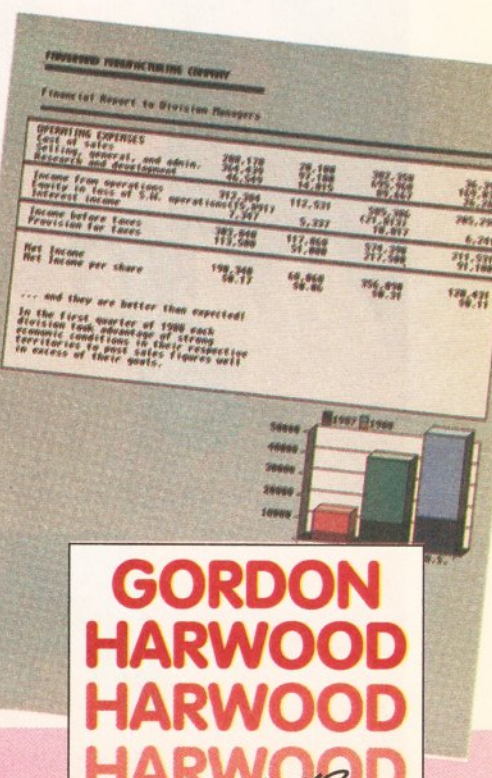
"...Please let me tell you how amazed I am at how EASY IT IS TO USE PEN PAL. The manuals supplied are very informative and very clear..." *P.S.S., Clifton, NOTTINGHAM*

"...A most excellent piece of software..." *E.P.H., Strathclyde, SCOTLAND*









Trade Distributors...

SDL

Precision Software

CENTRESOFT

HBM HB MARKETING

Pen Pal Order Line

0773 836781

Pen Pal is also available from good computer stores everywhere!

Pen Pal is supplied into the UK through...

Gordon Harwood Computers New Street Alfreton Derbyshire DE5 7BP
Telephone: 0773 836781 Facsimile: 0773 831040

GORDON HARWOOD HARWOOD HARWOOD Computers

ALL PRICES INCLUDE VAT, COURIER DELIVERY



AMIGA GALACTIC PACKS

GALACTIC PACK I

- AMIGA A500 COMPUTER
- WICKED 50 GAMES PACK
  50 great games to get you going!
- QUICKSHOT TURBO MICROSWITCHED JOYSTICK
- HIGH QUALITY MOUSE PAD
- TAILOR MADE DUST COVER

£329.99

ALL OUR AMIGAS COME WITH THE FOLLOWING AS STANDARD

- 2 YEAR GUARANTEE
- 1 mb DISK DRIVE
- TV MODULATOR
- 4096 COLOURS
- SPEECH SYNTHESIS
- AMIGA BASIC
- DIGITAL STEREO SOUND
- MOUSE
- CONNECTING CABLE
- USER MANUALS
- WORKBENCH 1.3
- NOTEPAD WORDPROCESSOR

GALACTIC PACK II

- AMIGA A500 COMPUTER
- CARTOON CLASSICS
  Bart Simpson vs The Space Mutant
  Lemmings • Captain Planet
  De Luxe Paint III
- OFFICIAL A500 1/2 MEG UPGRADE
- ADDICTIVE HITS
  Rainbow Island • New Zealand Story
  Bubble Bobble
- WICKED 50 GAMES PACK
  50 great games to get you going!
- QUICKSHOT TURBO MICROSWITCHED JOYSTICK
- HIGH QUALITY MOUSE PAD
- TAILOR MADE DUST COVER

£399.99

STEREO COLOUR MONITORS

PHILLIPS 8833/MK2
£249.95*
*Free F19 Stealth Fighter

CBM 1084S
£269.95*
*Free Silent Service II

COMPLETE PERIPHERAL PACKS

PACK 1

PROTAR 512K RAM Upgrade with clock • 40 capacity lockable disk box • 20 3.5" DS/DD disks with labels • 3.5" disk drive cleaner kit

all for just £39.95

PACK 2

PC 880B intelligent disk drive • Protar 512K RAM upgrade with clock • 40 capacity lockable disk box • 20 3.5" DS/DD disks with labels • 3.5" disk drive cleaner kit

all for just £99.95

CONSOLE CORNER

ALL PRICES INCLUDE COURIER DELIVERY & 2 YEAR GUARANTEE

CONSOLE SYSTEMS

Sega Master System..............£59.95
Sega Master System Plus......£79.95
Sega Megadrive..................£129.95

COLOUR PORTABLES

Atari Lynx................£84.95
Sega Game gear.......£99.95

We stock a wide range of software and peripherals for all of the above ring for details

FutureWorld computers

PLUS A COMPREHENSIVE 2 YEAR GUARANTEE!

PRINTERS

All printers come with connecting cables free of charge

STAR GOLD STAR DEALER

LC-20 MONO 9 pin Dot Matrix, 180/45 cps.
£149.95

LC-200 COLOUR 9 pin Dot Matrix, 185/45 cps.
£214.95

LC-24/200 MONO 9 pin Dot Matrix, 180/45 cps.
£259.95

LC-24/200 COLOUR 24 Pin Dot Matrix, 220/55 cps.
£309.95

CITIZEN PREMIER SUPER DEALER

120D+ MONO 9 pin Dot Matrix, 120/25 cps.
£149.95

SWIFT COLOUR 9 pin Dot Matrix, 160/40 cps.
£214.95

124D MONO 9 pin Dot Matrix, 144/48 cps.
£209.95

SWIFT 24 COLOUR 24 Pin Dot Matrix, 160/50 cps.
£319.95

PRINTER STARTER PACK

• UNIVERSAL PRINTER STAND • QUALITY DUST COVER • 200 SHEETS OF PAPER

All for only £9.95

AUTHORISED PROTAR STOCKISTS

THE VERY BEST IN PERIPHERAL ADD-ONS

PROTAR 512K UPGRADE WITH CLOCK
Features compact 4 chip design, on/off switch.............................. **£29.95**

PROTAR 'VISTO' COLOUR MONITOR
Identical to Phillips 8833 MKII.. **£248.00**

PROTAR A500 HARD DRIVES
Features 8mb internal RAM expansion facility
A500 HD - 20 meg...**£279.95** A500 HD - 30 meg.....**£349.95**
A500 HD - 50 meg.................**£429.95**
Configurations available up to 160 meg - please call for details

POWER DISK DRIVE STARTER PACK

New PC880B intelligent disk drive featuring: Blitz Hardware, Virus Hardware, Anti-click, Thru-port, Isolating Switch • Ten 3.5" DS/DD disks with labels • 40 capacity lockable disk box • 3.5" disk drive cleaner kit

Only £69.95

YOUR NEAREST FutureWorld STORE

BEDFORD
70 High Street Bedford Telephone 0234 217070

NORTHAMPTON
1-7 College Street Northampton Tel: 0604 33996

WELWYN GARDEN CITY
16 Church Road Welwyn Gdn City Tel: 0707 390029

ORDERING MADE EASY

BY PHONE
Simply call our Head Office quoting your Access/Visa number on
0234 218060 (5 lines)

BY CALLING PERSONALLY
Simply call into your nearest FutureWorld store where our fully trained personnel will be more than happy to deal with your requirements

BY POST
Make cheques, Building Society drafts or Postal Orders payable
FUTUREWORLD COMPUTERS LTD
UNITS 25-27 SERGEANTS WAY
ELMS INDUSTRIAL ESTATE
BEDFORD MK41 0EH

Please write cheque guarantee card number on reverse of cheque to ensure same day clearance

REMEMBER
ALL PRICES INCLUSIVE OF VAT & COURIER DELIVERY

FINANCE
Finance available to suit your specific needs. Written details on request. Instant credit is available in all FutureWorld stores.

PREMIER GOLD CARD
• 7 day money back guarantee if not completely satisfied
• 30 day exchange for new policy should a fault occur
• 2 year guarantee giving free collection and delivery service should a fault occur
• Exclusive Premier Gold Card with Personal Membership Number entitling you to special offers
• All this for only £19.95 per item purchased

2 YEAR GUARANTEE
For the whole guarantee period, warranty service will be completely free of charge

TECHNICAL SUPPORT/ON SITE ENGINEERS
Being authorised service centres for AMSTRAD, COMMODORE & STAR, we are equipped to deal with the majority of queries

FULLY COMPUTERISED ORDERING SYSTEM
This enables our telesales staff to provide up-to-the-minute stock information coupled with efficient dispatch

FULL TESTING PROCEDURE
All computer hardware is tested prior to dispatch maintaining our motto:

Simply the BEST



HARD DRIVING!!!

A590	20Meg	W.Digital	XT	299.95
A590	52Meg	Quantum	SCSI	489.95
A590	105Meg	Quantum	SCSI	639.95
A590	210Meg	Quantum	SCSI	899.95
A590	Syquest	44Meg Portable		589.95
A590	Syquest	88Meg Portable		689.95

BARE SCSI/IDE DRIVES

Quantum	17/9Ms	52Meg	64K Cache	229.95
Quantum	17/9Ms	105Meg	64K Cache	384.95
Quantum	15/8Ms	210Meg	64K Cache	669.95
Syquest 44Meg removable			SCSI	499.95
Syquest 88Meg removable			SCSI	649.95
Panasonic 1 gigabyte worm drive			SCSI re-writable	2499.95
External SCSI Case, inc PSU				89.95

CONTROLLERS & SYSTEMS

Dataflyer SCSI hard disk controller (20Meg) A500	From 259.95
GVP Series 2 (A1500/2000) SCSI + upto 8Meg of RAM	199.95
GVP Series 2 (A1500/2000) no RAM option	174.95
Xetec Fastcard + (A1500/2000) SCSI + upto 8Meg	199.95
Xetec Mini Fastcard (A1500/2000) SCSI Card only	99.95
Nexus (A1500/2000) High Speed SCSI + upto 4Meg	199.95
GVP Series 2 (A500) 52Meg SCSI + upto 8Meg RAM	529.95
GVP Series 2 (A500) 105Meg + upto 8Meg RAM	681.95

INMATE: A500/1500/2000 — High Speed SCSI Interface + upto 8Meg RAM + 68881 co-pro option, inside the Amiga — 219.95

QUANTUM is the ROLLS ROYCE of Hard Disks. Do not be misled by cheaper/slower systems incorporating inferior drives. Quantum are so sure that their drives are the best that they give a 2 YEAR WARRANTY on the units. As the saying goes "YOU GET WHAT YOU PAY FOR"

A1500/2000 52Meg Hard disk card QUANTUM............339.95
A1500/2000 105Meg Hard disk card QUANTUM...........489.95

AMIGA
A1500
COMPUTER
INC. SOFTWARE NO MONITOR
659.99
INC. SOFTWARE & MONITOR
929.95

OMEGA PROJECTS

14 DERWENT CLOSE
CULCHETH
WARRINGTON
CHESHIRE, WA3 5DY

A3000 RAM 256*4 80ns 1Meg	69.99
A3000 RAM 1024*4 80ns 4Meg	299.99
A500 Replacement Int. Drive	55.00
A1500/2000 Internal Drives	59.95
A590 CMOS RAM Chips (512K)	19.95
B2000 18 Pin Drams (2Meg)	109.95
256*1 Drams 150ns	0.99
1.3 Roms	34.95
1Meg x 8 SIMMS (2Meg) 80ns	79.95
4Meg x 8 SIMMS (8Meg) 80ns	349.95
4 Channel audio mixer + mic	34.95
Condenser mic	14.95
Sound Trap 3 + Mini-Midi	47.95
Sound Trap 3 + Audiomaster 2	55.00
Sound Trap 3 + Audiomaster 3	84.95
Mini-Midi + Music-X	99.95
Audiomaster 2	29.95
Audiomaster 3	55.00
X-Copy Professional v3.3	32.95
Byte 'n' Back (H/Disk backup) v3.1	19.95
3.5" Ext. Drive (Cumana)	59.95
3.5" Ext. + Track Counter	88.49
KCS Power Card (PC Emulator)	234.95
AT-Once Card (PC/AT Emulator)	199.00
5.25" ext. Disk Drive (40/80 TRK)	90.00
Parallel Printer Cables	from 9.95

C.D.T.V. Commodores new INTERACTIVE VIDEO SYSTEM — NOW IN STOCK — ***579.95**

23Way Connector no hood	1.49
23Way Connector + hood	1.99
X-Copy Hardware only	9.95
3.5" Blank Disks	0.39
10 Cap. Disk Boxes	1.49
40 Cap. Disk Boxes	4.50
80 Cap. Disk boxes	4.95
A500 Dust Covers	2.99
Mouse Mats (6mm neoprene)	1.99

A500 BASEBOARD
4/6 Meg Trapdoor Expansion
Works with 1 Meg Chip RAM

0K	90.00
512K	110.00
1Meg	130.00
2Meg	165.00
3Meg	200.00
4Meg	230.00
2Meg Add-On Card	80.00

NAKSHA MOUSE
22.95

REPLACEMENT
A500
INTERNAL DRIVE
55.00

AMIGA A500
CARTOON PACK
***359.95**
AMIGA A500
1Meg CARTOON PACK
***374.95**

512K RAM
inc. CLOCK & SWITCH
21.95
19.95 NO CLOCK

ARE YOU TIRED OF BACKING UP TO FLOPPY?
HAVE YOU EVER CONSIDERED A
TAPE STREAMER
If so, then contact us for more information on a WIDE range of SCSI Tape Streamers for ALL SCSI controllers, including the A590.

SPECIAL PACK
WHILE STOCKS LAST
DELUXE PAINT 3
THE WORKS (P/NUM)
SIM CITY
POPULOUS
BATTLE CHESS
THEIR FINEST HOUR
99.99

FREE
6mm QUALITY MOUSE MAT
WITH EVERY ORDER OVER 50.00

0925-763946
FOR ORDERS & TECHNICAL QUERIES

IF YOU THOUGHT THAT THE AMIGA SOUND WAS GOOD THEN YOU ARE IN FOR A REAL SHOCK, AS YOU CAN ENHANCE THE SOUND TO NEW HEIGHTS WITH THE BRAND NEW RELEASE FROM OMEGA PROJECTS: LOOK OUT FOR THE REVIEWS

SOUND ENHANCER

HARDWARE **34.95** 100% COMPATIBLE WITH ALL SOFTWARE

ON DEMONSTRATION AT:

BYTES & PIECES	0253-795376
CAVENDISH COMM. CTR	0533-510066
NEW AGE COMPUTING	0992-465366
THE SOFTWARE HOUSE	0382-24141

The increase in sound quality is absolutely ASTOUNDING
EVERY Amiga owner should own the SOUND ENHANCER
AMIGA COMPUTING

Music freaks are in for a real treat with the SOUND ENHANCER from OMEGA PROJECTS
AMIGA SHOPPER

SOUND ENHANCER takes the Amiga sound quality to a new HIGH
COMPUTER EXPRESS

CALLERS WELCOME BY APPOINTMENT

ALL CHEQUES, P.O., ETC SHOULD BE MADE PAYABLE TO OMEGA PROJECTS, WE ALSO TAKE ACCESS, VISA, MASTERCARD & EUROCARD

continued from page 52

that I may be spending money on an obsolete unit. I am particularly interested in digitising, animation and arts packages, which tend to be very memory-hungry. Is it possible to upgrade my A1000, and how would you suggest that I do it? Which hard disk and how much extra RAM would you advise?

I was also disappointed that when I first bought the A1000 I also bought Digi-View 1.0 and found that it would not work with my colour camcorder – only with a black-and-white camera. Will the latest version, Digi-View Gold, work with a colour camera and can I get 768 x 592 resolution with my A1000 plus extra memory?

A Proctor
Chester
Cheshire

I would advise that you get a minimum of 2Mb RAM and as large a hard disk as you can afford.

It is actually possible to fit an A590 20Mb hard disk to an A1000, if you don't mind it being back to front. You can also add up to 2Mb of RAM to the A590. So that's one cheap and dirty option. Otherwise, you could scout the small ads as you can sometimes find A1000 memory cards (such as Insider II) being sold off cheaply.

But to be honest, since you are interested in graphics and animation, I think that you would probably be better off changing to a second-hand B2000 or new A1500, both of which offer far better expansion possibilities than the A1000. Make sure that the model you buy has the Fatter Agnus chip fitted and working, though! It is possible to upgrade the A1000 but it probably isn't worth the cost in the long run. Incidentally, since I have an old A1000 myself I'd be interested in readers' comments about extending their useful life.

On the Digi-View 1.0 question, I think you will find that a colour camera will work successfully, but only if you have a way of splitting the colour signal into the RGB components required. To do this you will need a colour splitter (see page 59 of this issue for details). The same is certainly true of the current Digi-View Gold, and colour digitising can be done easily with a colour splitter. You should also be aware that your 'old' Digi-View hardware can use the new software – so you may just be able to get a software upgrade, rather than having to buy a new Digi-View. If you change to another Amiga, though, you will need to buy a gender changer as the parallel port fitting was changed after the A1000.

I used to be able to get 768 x 592 resolution with my A1000 (with 1.5Mb memory), so you should certainly be able to do that. ***GW***

RADICAL SPEED-UP

A I have been using the RAD: recoverable RAM disk to speed up my system a bit. I have read that FFS can be used on RAD: but I have had no success getting it to work. I've tried changing the MountList entry, changing DOS type, Boot priority and adding the 'filesystem' line. I have also tried formatting RAD: with the FFS option, all to no avail. What am I doing wrong?

I am soon to purchase a 40Mb hard disk, and have read that I need to partition the hard disk to boot up the Amiga. Will formatting hard disk partitions to FFS be as difficult as it is for RAD:? I would appreciate it very much if you can solve my problems for me.

Philip Chung
Cheltenham
Gloucestershire

The recoverable RAM drive (RAD:) may be used with the Fast Filing System (FFS) by changing the Boot priority in the DEVS:MountList file for RAD: to -129 and then setting the file system entry to reflect FFS. This appears to work without problems, although the logic for doing this seems a little bizarre. By converting RAD: from the Standard File System (SFS) to FFS, you will also ensure that RAD: will not auto-boot from a reset. If you are keeping commands in a non-booting RAD:, then you might just as well store them in dynamic RAM: and make better use of your available memory.

The distinct advantage that RAD: has over RAM: is that it is auto-booting, and if you take this facility away from RAD: then frankly I don't see what you will achieve, except a slight improvement in access time – which is already fast – due to the fact that RAD: is a memory drive.

Almost all the literature regarding hard disks refers to making two partitions: one standard partition from which the Amiga auto-boots and then hands control over to the FFS partition for faster access. With the advent of newer hard drives, this partition is no longer necessary. It will, of course, depend on the hard disk in question; most new hard disks can be formatted completely under FFS and still be able to auto-boot successfully. You should not have a problem with partitioning. Some people actually prefer two partitions on disk, one OFS and one FFS. If this is the case, then you should make the OFS partition as small as possible while still being able to hold a few commands from the C:, Devs:, L:, Libs: directories and so on, and a small startup-sequence that transfers control to the FFS partition as soon as possible.

Finally, there will be a slight reduction in speed when using a hard disk compared to RAD:. However, it is more practical; it uses FFS (and auto-boots) and it is much larger. ***MD***

MANHATTAN MAGIC

I have an A500 with 512K and am interested in video titling. I have already used the Video Out from my modulator to do some basic titling but I would now like to take this one step further.

How do I superimpose Amiga graphics over a pre-shot video? For instance, I would like to use arrows to illustrate some footage of New York. I heard this is possible with a genlock but I'm not well up on the hardware. Can you help me?

Daniel Hardy
Wigan
Lancs

Yes, you're absolutely right – a genlock will certainly do the job. And you should get better quality to boot!

A genlock causes the Amiga to be synchronised to the video signal from a video camera or VCR. As a result, the Amiga signal can be successfully superimposed over the video signal – usually by 'replacing' all occurrences of colour 0 in the Amiga image (the first colour in the palette of *Deluxe Paint*, for instance) with the video image.

An important point to note here is that the quality of genlocking is very much dependent on the quality of the video signal input. The better the video quality, the better the stability of the super-imposition will be – even on the most expensive units. So when you're thinking about buying a genlock, bear this in mind. Since there is such a range of genlocks available now, and at so many different prices, I find it difficult to recommend one to suit your needs, without knowing more about your budget. ***GW***

Z80 ASSEMBLER

After Keith Rickard's letter in issue 4, in which he asked for a Z80 cross-assembler, Richard Keeble wrote in to say he has just the thing. The program was written by him; it supports all opcodes, global, local, permanent and alterable labels, and includes an expression evaluator.

If Keith (or indeed anyone else) is interested in this program, they can get it from Richard for 'a reasonable fee'. Richard Keeble can be contacted at:

30 Glencoe Road
Ipswich
Suffolk
IP4 3PR

BOUNCING BALLS

I want to write an AMOS program to animate a number of balls as bobs. Each has a set of start coordinates. Let's call these (X1,Y1) (X2,Y2) and so on.

Each ball is given a velocity in both the x-direction and the y-direction. Let's call these velocities (DX1,DY1) (DX2,DY2) and so on.

In the main loop, the balls are made to move as follows:

```
Do
   X1=X1+DX1
   Y1=Y1+DY1
   X2=X2+DX2
   Y2=Y2+DY2
Loop
```

How do I make the balls interact with each other realistically? Obviously the first step is to detect

continued on page 58

JARGON BUSTING

Autoboot – Booting is the process that occurs when a disk is inserted and accepted at the 'Insert Workbench' prompt. A hard disk or RAD: will autoboot, meaning that the relevant programs on them will be run automatically after a reset or, in the case of a hard disk only, as soon as the Amiga is switched on.

FFS – Fast Filing System. A new filing system driver that was introduced with Workbench 1.3. Disk blocks are arranged so that large amounts of data can be read quickly. Reads and writes are increased in speed by up to seven times. Directory searching is around 10 times faster and the hard disk partition limit is raised to two gigabytes. Some older hard disk systems cannot boot with FFS. Also, the FFS not available with floppy disks under AmigaDOS 1.3.

continued from page 57

a collision between the two balls. Then, somehow, I think that the balls must be made to bounce realistically via an equation involving a comparison between the balls' X and Y positions and their velocities. It is this equation that eludes me.

Stephen Mackenzie
Woodsmoor
Stockport

First, I've chosen to hold the balls' coordinates and velocities in arrays. That way a simple loop will take care of any number of balls.

There are two equations you need to take account of: the conservation of momentum, and the conservation of kinetic energy. These two equations are:

$$M_1*V_1 + M_2*V_2 = M_1*V_1' + M_2*V_2'$$

$$\tfrac{1}{2} M_1*V_1^2 + \tfrac{1}{2} M_2*V_2^2 = \tfrac{1}{2} M_1*V_1'^2 + \tfrac{1}{2} M_2*V_2'^2$$

Where V' is the new velocity after the collision.

There's a subtle complication here. The conservation of energy equation relies only on the magnitude of V, not the direction, whereas the momentum equation relies on the directional information as well.

Solving these equations had me flummoxed for days, I don't mind telling you. Then I hit on the trick. As your problem stands, you have the velocities resolved along the x and y axes. For the purposes of a collision, a different coordinate frame has to be used.

Imagine the moment when two spheres collide. Draw a line between the centre of the two spheres, and another at right angles to this. This is the new set of coordinates into which the velocities have to be resolved. The reason for this is as follows: the two balls rebound off each other along the radial axis, conserving momentum, but there is no change in momentum for either ball along the tangential axis, since the balls' velocities along this axis take no part in the collision.

The equations are solved by working out the angle which the radius of the two balls makes with the x axis, and hence the relation of the radial/tangential coordinate system to the x/y coordinate system. Then the balls' velocity vectors are resolved along the new set of axes and the law of conservation of momentum is applied. Combine this with the law of conservation of kinetic energy for the overall velocities of the balls, and you end up with two extremely large simultaneous equations.

I assumed that the mass of the balls is equal, because doing so results in the solution falling out rather neatly. If you want to do otherwise, I'm afraid you'll have to solve the equations yourself. I've also assumed, as they say in physics text books, that the collision is perfectly elastic and that there are no frictional effects.

There's not enough space to show you how I arrived at the solution, but it ends up as being:

$$DX_1' = DX_1*S_2 + DX_2*C_2 + (DY_1 - DY_2)*C*S$$

$$DY_1' = DY_1*C_2 + DY_2*S_2 + (DX_1 - DX_2)*C*S$$

$$DX_2' = DX_2*S_2 + DX_1*C_2 + (DY_2 - DY_1)*C*S$$

$$DY_2' = DY_2*C_2 + DY_1*S_2 + (DX_2 - DX_1)*C*S$$

Where DX is the velocity in the X axis and DY is the velocity in the Y axis, and C=cos(W) and S=sin(W). The angle W is the given by

$$\tan(W) = (Y_1 - Y_2) / (X_2 - X_1)$$

To make things a little clearer, here is an AMOS listing to bounce four balls around:

```
Screen Open
0,320,200,2,Lowres
MAKESPHERES
Dim
X#(4),Y#(4),DX#(4),DY#(4),      ↵
DXT#(4),DYT#(4)
For I=1 To 4
 X#(I)=Rnd(319)
 Y#(I)=Rnd(199)
 DX#(I)=(Rnd(12)-6)/3
 DY#(I)=(Rnd(12)-6)/3
Next I
Do
 For I=1 To 4
  If X#(I)<=0 Then              ↵
DX#(I)=Abs(DX#(I))
  If X#(I)>=319 Then DX#(I)=↵
-Abs(DX#(I))
  If Y#(I)<=0 Then
DY#(I)=Abs(DY#(I))
  If Y#(I)>=199 Then DY#(I)=↵
-Abs(DY#(I))
  X#(I)=X#(I)+DX#(I)
  Y#(I)=Y#(I)+DY#(I)
  Bob I,X#(I),Y#(I),1
  If Bob Col(I)=-1
   For J=1 To 4
    If I<>J and Col(J)=-1
     W#=Atan((Y#(I)-Y#(J))/ ↵
(X#(J)-X#(I)))
     S#=Sin(W#) : C#=Cos(W#)
     DXT#(I)=DX#(I)*S#*S#+  ↵
DX#(J)*C#*C#+(DY#(I)-       ↵
DY#(J))*C#*S#
     DYT#(I)=DY#(I)*C#*C#+  ↵
DY#(J)*S#*S#+(DX#(I)-       ↵
DX#(J))*C#*S#
     DXT#(J)=DX#(J)*S#*S#+  ↵
DX#(I)*C#*C#+(DY#(J)-       ↵
DY#(I))*C#*S#
     DY#(J)=DY#(J)*C#*C#+   ↵
DY#(I)*S#*S#+(DX#(J)-↵
DX#(I))*C#*S#
     DX#(I)=DXT#(I)
     DY#(I)=DYT#(I)
     DX#(J)=DXT#(J)
    End If
   Next J
  End If
 Next I
Loop
Procedure MAKESPHERES
 Ink 1,0,1
 Circle 20,20,10
 Paint 20,20,0
 Get Bob 1,10,10 To 31,31
 Hot Spot 1,$11
 Cls 0
End Proc
```

All of the variables must be real, of course – there's not a great deal of point in adding fractional velocities to integer coordinates, because most of the information will be lost and the objects will move very jerkily around the screen – if the program works at all, that is.

I've defined the bobs simply by drawing a circle on the screen and using AMOS's Get Bob function. I've used the Hot Spot function to make the bobs' coordinates refer to the centre of the spheres, as required by the equation for the angle W.

As well as the position and velocity arrays for the balls, I've used a temporary array for storing the new velocities after the collision. This is because the equations for the new velocities are dependant on the old velocities, which must therefore be retained for a time.

The program works fine... well, almost. You may occasionally notice some strange behaviour, whereby two balls become rather attached to each other. This phenomenon will occur if a collision between the two is detected and, although the velocities are changed, the balls move away from each other slowly enough for another collision to be detected, in which case they will begin moving towards each other again. The only remedy I can suggest for this (and I admit that it's essentially a bodge) is to move the two colliding balls away from each other by a pixel or so independently of their velocities. This can be done by inserting the following two lines just before the 'End If' and 'Next J' lines, after the re-calculations of velocities for a collision:

```
X#(I)=X#(I)+Sgn(DX#(I))
X#(J)=X#(J)+Sgn(DX#(J))
Y#(I)=Y#(I)+Sgn(DY#(I))
Y#(J)=Y#(J)+Sgn(DY#(J))
```

And all I can say after that is, good luck with your program! ***CR***

JARGON BUSTING

Bob – A blitter object. This is a software sprite, moved around the screen by the Amiga's super-fast blitter.

C – A compiled language designed primarily for systems programming. It was used to write much of the Amiga's operating system, and is used to write many Amiga applications.

Digitiser – A device which takes analogue information from a source such as a video camera and converts it to digital screen information for use by a computer.

Flicker fixer – A card which plugs into the A2000's video slot and removes the flicker from the Amiga's interlace mode and the visible scan lines in the non-interlace mode. Interlace mode is the Amiga's way of doubling the vertical screen resolution, but this normally effectively halves the screen update rate and creates a flickering on the screen.

Hot spot – The part of a sprite or bob which is used as a reference point for the object's coordinates. The hot spot of the sprite is the pixel that appears at the screen position specified by the sprite's coordinates.

Script – A collection of AmigaDOS commands. Referred to as a batch file on other systems.

Velocity – An object's velocity is different from its speed, in that velocity includes information about the direction of travel. For an object in a two-dimensional screen, its velocity can be represented by two parts, one in the x direction and one in the y. The components will be positive if the object is travelling across and down the screen respectively, negative otherwise.

SONY SO FAR

I have been lucky enough to acquire a bare Sony 3.5-inch disk drive and I want to use it with my Amiga 500. Building an interface and a cable are no problem as I have access to a fully-equipped electronics workshop. Apparently the drive came out of an old Apricot computer, but I don't know which one. I hope you can help me connect this unit to my Amiga.

C C Smith
West Lothian

Unfortunately the drive you mentioned is quite an old model and I have been unsuccessful in digging out any information on it. From the information in your letter I can tell you that CN109 is the data connector, a standard Shugart-type floppy connector. CN108 is the 4-way power connector. Both of these should be identical to the connectors on your A500 internal drive. S101 is the drive ID switch; leave this set to 1. To connect this to your Amiga you will have to build an Amiga-to-Shugart converter. This is a very simple circuit involving two 74 series chips. Details for building this can be found in issue 6 of *Just Amiga Monthly* (☎ 0895 574449). ***JR***

QUALITY DIGITISING

I own Digi-View 4.0 but my results are usually of lesser quality than the perfect images produced in reviews of the product, even using slow scan. I use the recommended black-and-white Panasonic WV-1410 camera. I use full daylight to illuminate my subjects. What is the best 'tracking' number to use for this camera and for other sources such as the freeze-frame on the Ferguson Videostar 3V53 VCR?

Could you also give me some advice on RGB splitters for use with Digi-View and tell me whether all splitters work just as well on Digi-View as on other video digitisers?

To finish, can you tell me which is the better signal for recording to a VCR from a modulator. Is it the RF or the separate video and audio?

Paul Rose
Radlett
Herts

I use a black-and-white Panasonic WV-1500 myself, with tracking set at 0. It works fine for me. However, if you are having trouble, the best way to fix it is to keep making small adjustments until you find the optimum settings for your system. This also applies to the VCR. Remember that when using a VCR the freeze frame must be perfectly still, or the digitised image will be blurred. Similarly, your video camera should be securely mounted and not moved until digitising is complete.

It is possible that the images you are referring to were digitised with a rather more expensive camera than a WV-1410. Better cameras with higher resolutions result in better quality digitising – especially when using the newer, CCD chip cameras. You may also find that the video tube in your camera is old or has gone 'soft' as a result of being left pointed at a scene for too long. You must always be careful with tube cameras as it is extremely easy to cause permanent damage to the video tube by using very bright light (including sunlight) and leaving the camera pointed at the same image for long periods. Cap the lens whenever the camera is not in use.

Any RGB splitter should work on Digi-View, as well as with other digitisers. An RGB splitter simply provides an electronic way of filtering the video signal to provide the red, green and blue components required by the digitiser to produce the final, colour image. Note that colour splitters will only work correctly when the video signal itself is in colour. I actually built my own several years ago, but the Rombo VidiRGB splitter which I reviewed recently (*Amiga Shopper* Issue 5) should do the job just as well.

The best signal has to be the video one, since the RF signal will be a converted version of the video signal and hence poorer quality. ***GW***

STARTING SMALL

I need a word processor but I am also interested in the various graphics applications of the Amiga. I have around £1,500 available to spend on a system but I want to start small.

What would be the ideal expandable hobbyist setup for me? Should I consider a flicker fixer and multisync monitor from the start, and will expanding the A1500 turn out to be cheaper in the long run, or should I start with the A500?

What disk drive should I consider getting, and can I buy software and hardware in Germany and the USA, where everything appears to be cheaper?

Stefan Ulanowski
London

If you want to start small, then the A500 has to be the starting point. The A1500 will allow you to use a flicker-fixer, but although the cost of this type of equipment has reduced, I would not consider that buying an A1500 with a multisync monitor could be regarded as starting small by any stretch of the imagination!

My suggestion for the use you have in mind would be to purchase an Amiga A500 with at least 3Mb of RAM. The standard Commodore 1084 or Phillips CM8833 monitors should be sufficient to begin with. Choose the best priced hard disk you can find. I would suggest that you do not consider anything with less than 40Mb capacity. A smaller drive soon becomes impractical once Workbench and a few programs and utilities are copied on to it.

You will also need a good quality printer – not just for your word processing requirements, but to produce a reasonable quality print from your graphics applications. Assuming that you wish to keep the cost down, then I suggest that you look at some of the colour 24-pin dot-matrix printers which are currently available.

I am not aware of problems with software or hardware bought in Germany running on UK machines. However, I would suggest that you avoid American hardware, due to the fact that our PAL and the American NTSC raster standards are incompatible. ***MD***

NORTHC RESCUE

I recently obtained *NorthC V1.3* via Bruce Smith Books after purchasing the *Mastering Amiga C* book. I can unpack the disk as described, but from then on the instructions become less clear. I am not a total novice to the Amiga, having owned one for over two years, but all attempts to create a C programming environment from the disk have been to no avail. Could you provide some simple step-by-step advice? I have an A500 with a 0.5Mb expansion installed (but only the internal drive).

M Sutton
Waunarlwydd
Swansea

To start with it is worth pointing out that, in the beginning, almost everyone has problems with C compilers and the related task of creating compiling environments. With all public domain, and other non-commercial offerings, these problems are compounded because the documentation is scattered around the disk as a selection of readme/doc files as opposed to being presented in a printed manual. The documentation is also rarely aimed directly at users who are new to the world of compiling.

To be fair, however, there is actually a reasonable amount of documentation provided on the *NorthC* disk and now that you have unpacked the disk it would be a good idea to print out all of the readme/doc files that you can find. You won't understand it all but believe me it does help to have a hard copy to refer to. Amongst these files you'll find compiler, assembler, linker and library documentation, notes about creating bootable disks, some *NorthC* questions and answers and plenty of code examples.

As far as creating a C environment goes, this is also explained in detail on the disk and Steve Hawtin has provided some quite flexible script files which do all the setting-up operations for you. What is explained in less detail, however, are the reasons why various things have to be done in the first place.

First let's look at the compiler tools (*cc*, *NorthC*, *a68K*, *blink* and so on). These, as you've probably already realised, are held in the 'bin' directory of the *NorthC* disk, but copies of these programs can be moved anywhere – it can, for example, be convenient to copy these tools to the RAM disk when using a 1Mb single-drive system. The important point here is that, one way or the other, the system needs to be able to find these tools during the compilation process. In a similar fashion, the compiler will need to know where to look for any 'include' files and it, or rather the linker, will need to know whereabouts on your disk the library functions can be found when it runs.

continued on page 60

I SEE NO TIPS

Don't need our help? Reckon you can do a better job of giving advice and tips? Well, do it! As well as asking for advice, we want you to give it, too. If you have discovered a useful tip for any program, hardware, language or whatever, send it to us and if it's any good we will use it on the Amiga Answers pages and bung you £5 in return. If you think we have got an answer wrong, or haven't given the full picture, give us what you think is the right answer – we might even cough up some cash for that too! So don't just sit there, get tipping and help out your fellow Amiga owners. Send your cunning solutions to: Amiga Tips, *Amiga Shopper*, 30 Monmouth Street, Bath BA1 2BW.

continued from page 59

As I've mentioned, *NorthC* provides a series of script files – you should also print out, and study, the ones called 'Setup-NorthC', 'Single-Make' and 'Single-Disk', because these files are the ones which allow you to set up your compiler 'environment' automatically. Now, all of this is explained in the disk documentation and there's little point in repeating it. There is, however, nothing 'magic' about these files and it is just as easy to create alternative arrangements.

Here's an alternative scheme which should give you the starting point you need: after booting up from your Workbench disk, open a CLI and type (as two separate commands) these lines:

```
setenv INCLUDE NorthC:   ↵
include/
assign clibs: NorthC:clibs
```

These statements will tell *NorthC* where to find the include files and the library files (you'll be asked to insert the NorthC disk when you type the assign command – insert it, and when the 1> prompt reappears replace your Workbench disk).

Now copy the 'copy' command to the RAM disk using the command:

```
copy df0:c/copy to ram:
```

and then replace the *NorthC* disk and copy its compiler tools into the RAM disk using these instructions:

```
ram:copy df0:bin/cc to ram:
ram:copy df0:bin/NorthC      ↵
to ram:
ram:copy df0:bin/a68k to ram:
ram:copy df0:bin/blink to ram:
```

Finally, insert the Workbench disk and type:

```
cd ram:
```

to make the RAM disk into the current directory.

Since the current directory assignment is now the RAM disk, all of your source files and intermediate files will now be automatically placed in the RAM disk as they are created.

Your first example program, in the true tradition of the C programmer, ought to be the 'hello world' program. Create a source file (using the *Ed* text editor) by typing:

```
ed hello.c
```

Now enter the most famous C program in the world, namely:

```
#include <stdio.h>
main()
{
   printf("Hello World\n");
}
```

Save it (by pressing [Esc] followed by X) and then compile the program using the 'cc' command:

```
cc -ohello hello.c
```

You will be asked to swap your *NorthC* and Workbench disks a couple of times, but essentially this is the sort of output you'll see as the compilation process proceeds:

```
1> cc -ohello hello.c

68000 Assembler - version
2.61 (January 11, 1990)
Copyright 1985 by Brian R.
Anderson
AmigaDOS conversion copyright
1989 by Charlie Gibbs.

Assembling hello.s

PASS 1 line nnnnn
PASS 2 line mmmmm
End of assembly - no errors
were found.
Heap usage:  -w2047,76
Total hunk sizes:  1c code,
10 data, 0 BSS
Blink  - Version 6.7 - 15
October 1986
Copyright © 1986 The Software
Distillery.  All Rights
Reserved.
235 Trillingham Lane, Cary NC
27511 - BBS: (919)-471-6436

BLINK Complete - Maximum code
size = 8112 ($00001fb0) bytes
```

That's all there is to it. Your program, called 'hello', will be sitting in the RAM disk waiting for you to run it by typing its name at the CLI window. ***PAO***

COBOLING IT TOGETHER



I am currently looking to buy a machine to use for entertainment and for some programming in COBOL, and the A500 is top of my list. The only problem is that I can't find anyone who can supply me with a COBOL compiler. I have checked with numerous PD libraries and software distributors. Can you help at all, or is my best option to buy a PC emulator for the A500 and get the software to suit that?

D A Cunnington
Cambridge

Unfortunately, it appears that no-one has ever produced a version of the COBOL language for the Amiga. There are versions of Fortran, Pascal, Lisp, Prolog, APL and almost every other language – but not COBOL. A PC emulator would be fine for using COBOL on your Amiga; your best choice is probably the KCS Power board (from Bitcon Devices ☎ 091-490 1919). ***JR***

SKEW SCROLLING



Following your recommendations, I bought the *Big Alternative Scroller* for my A500. However, it will not work with my Minigen genlock. Can you suggest what will?

T A Carrick
Cornwall

I spoke to Alternative Image and was informed that they are aware of the problems that *BAS* has with the Minigen. This may not be entirely the fault of the software, however. Applied Design Systems Ltd, which supplies the Minigen, thinks that the problem could be due to an incompatibility between the Minigen and your Amiga. This is apparently fixable if the Minigen is returned to the company. The address to return your unit to is: Queensway Business Centre, Brigg Road, Scunthorpe, South Humberside DN16 3RT ☎ 0724 280222. Let us know how you get on with this problem. ***GW***

COMMS BREAKDOWN



I bought a Datel 4192AX modem at a surplus electronics shop. Being new to comms, I thought it a bargain. No manual was included, but I had some info and thought it would do. The front panel consists of the four test buttons (AL, DL, RDL, ST) and

continued on page 65

JARGON BUSTING

CLI – Command Line Interface – a program that provides a window into which AmigaDOS commands can be typed. Also known as the Shell, although strictly speaking the Shell is another program that offers a number of additional facilities over the CLI.

COBOL – COmmon Business Oriented Language, used extensively on large computers in the commercial sector. It is also used, though to a lesser extent, on the IBM PC and compatibles.

Genlock – A way of linking one video source (for example the Amiga) to another (such as a video tape player) in order to synchronise their signals to allow various video effects including overlay between the two sources.

Library function – The Amiga has many special features, and programs are already present in the operating system to make use of these features. These programs, or library functions, may (and should) be used by applications programs, obviating the need for each programmer to write a similar set of routines.

PC emulator – A software or hardware addition to the Amiga which will enable it to run programs written for the IBM PC. This can be useful because there is a far greater range of business programs available for that machine.

DISK ICONS

Stuart Rumley of Tunbridge Wells in Kent wrote in to help Paul Compton in his endeavours to edit the RAM disk icon. Thanks Stuart, expect to receive a fiver in the near future.

If the RAM disk is going to be edited, you must first copy any disk icon to RAM:disk.info using the Shell or CLI. The following line will do this:

```
copy sys:disk.info to ↵
ram:disk.info
```

Next, go to *IconEd*, and in the file requester type 'RAM:disk' (leaving off the '.info'). The icon can now be edited. When saving, you must save the file under a different name, otherwise the icon will be lost after reboot. An example name is 'SYS:Ramdisk.icon'. Now you must edit your Startup-sequence, and include a line to copy the new icon to the RAM disk every time you boot. Type:

```
ed s/startup-sequence
```

Somewhere before the 'LoadWB' line, insert:

```
copy sys:Ramdisk.info to ↵
ram:disk.info
```

Now every time you boot you should get your new icon.

The Complete Colour Solution

by ROMBO

As official dealers for Rombo, we are now able to offer this excellent package at a great price. The Complete Colour Solution comes with RGB Splitter, Vidi Amiga, Vidi Chrome and Power supply.

now only £134.99

VIDI AMIGA

Frame grabber.

High quality digitizing. Inc Vidi chrome colourising software

only £84.99

RGB SPLITTER

Enables you to Colour Digitize in a second. Replaces red green blue filter set. Can be used with Digi view or Rombo products

only £64.99

THE NEW MICROBOTICS ACCELERATOR BOARDS

The VXL is an advanced 68030 accelerator for the Amiga 500/1500/2000 with space for an optional co-processor (CP)

VXL30 25Mhz EC............only £299.99
VXL 30 40Mhz EC...........only £499.99
VXL 30 25Mhz EC+CP....only £479.99

The VXL 30 25Mhz EC+FPU differs from the others in having Fast Page Mode. This allows it to accept an optional superfast 32 bit 2 to 8 meg RAM board running at 60ns

ICD Adspeed running at 14.7Mhz..£189.99

GOLDEN IMAGE HAND SCANNER

Due to a bulk purchase of this famous scanner, we are now able to offer you high quality scanning at a fraction of the normal cost. Complete with touch-up software the Golden Image scanner is able to pick out text and graphics at up to 400 d.p.i. Touch-up enables you to easily manipulate the image. Ideal for desk top publishing and presentation.

Offer price only £129.99 (while stocks last)

COME IN FOR A DEMO

DISCOUNT SOFTWARE

NEW!! DELUXE PAINT IV

Simply the best graphics package available on the Amiga. Now with Hold & Modify (HAM) DP4 gives you a pallette of 4096 colours. ***"a stunning innovation and probably the best software package for this market"........Steve Franklin MD for CBM***

only £79.99

PENPAL

This best selling word processor incorporates many features found only in a desk top publisher. Also includes an easy to use database.

Highly recommended

now only £54.99

PLATINUM WORKS

We believe this to be the best all round integrated business package on the Amiga. It comes with Platinum Scribble w/p, spell checker, thesaurus, Analyse (a "Lotus 123" compatible spreadsheet with 3D graphics), a database, sideways printing utility and communications software.

only £59.99

WORDWORTH

The latest highly acclaimed WYSIWIG word processor. Comes with multiple fonts, powerful theasurus, large spellchecker, speech synthesis

only £79.99

SUPER SOFTWARE BUNDLE

Their Finest Hour, Sim City + Terrain Editor, Populous + Promised Lands and Battle Chess

only £39.99 !

IMAGINE

Imagine, the ultimate 3D animation rendering system

now only £159.99 !

PAGESTREAM v2.1

A powerful DTP package for professional use

only £129.99

BROADCAST TITLER

requires 2 Mb

only £169.99

ART DEPARTMENT PRO

only £114.99

OTHER SOFTWARE

Deluxe Paint 3..................£39.99
Pagesetter 2 DTP..........£45.99
Pro Video Plus..............£149.99
New Amos Compiler.........£24.99
New Amos 3D..................£27.99
Sequencer One...............£74.99
Music X version 1.1..........£99.99
Digi View Gold 4..............£99.99
GB Route Planner.............£34.99
3D Text Animate...............£19.99
Text Scroller.....................£19.99
Flexidump printer utility.....£31.99
Xcopy utilities......................£33.99
SuperPlan Spreadsheet......£29.99

PERIPHERALS

Hard Drives:

Amiga A590 20 Meg

for A500 inc 2 meg of unpopulated RAM

only £289.99

or populated to 2 meg of RAM

now only £345.99

Protar Hard Drives for the A500 with 8 meg of unpopulated RAM

Size (Mb)	
20	£279.00
30	£428.00
50DC	£528.00
60	£541.00
80	£598.00
100DC	£638.00
160DC	£938.00

RAM expansion for hard drives...........£57.99 per Mb

The DC range have an access speed of 11 to 19ms, a 64K disk cache and come with full 2 year warranty. The standard range come with a 1 year warranty and run at 28 to 40ms.

Quantum Hard Drives

(requires hard frame)

52 meg.........£229.99
105 meg.........£369.99

GVP Series 2 Hard Disk Controller Card

with 8 MEG of unpopulated RAM (uses SIMM 1*8/9 cards) For the 1500/2000. Ideal for use with Quantum drives

only £199.99

Special offer!! HBM Genlock

same spec as the Rendale 8802 but with free Home Titler software

only £129.99

(limited stocks)

ICD Flicker Free Video

Ideal for use with a VGA monitor. Gets rid of annoying flicker

only £249.99

Samsung Super VGA Colour Monitor...£249.99

DISK DRIVES

Zydec 3.5"

1 meg external drive, high quality low noise and high reliability

only £57.99

Cumana 3.5"

1 meg external drive. The best name in disc drives now at a super low price

only £59.99

NAKSHA MOUSE

This famous Hi-res mouse now comes with Operation Stealth, mouse mat, holder and 2 year warranty

only £24.99

SQUIK MOUSE

very similar to the Naksha but without the extras

only £18.99

MONITORS

Commodore 1084SD1

Colour stereo monitor. 640*256 line resolution, green screen facility, cable for Amiga included

only £239.99

Philips CM8833 MK2

Colour stereo monitor. 640*200 line resolution, green screen facility, one years on site maintenance, cable for Amiga included

now only £229.99

or with F19 Flight Sim

only £239.99

RAM CHIPS

256*4 ideal for A590 & 1 Meg by 1 chips suitable for 8 up boards and others:

QTY	
4+	£4.99
8+	£4.79
16+	£4.49

1 MEG by 8/9 SIMM boards **only £37.99**

1 MEG ZIPS **only £24.99**

DISKS

All our disks 3.5" disks are <u>GUARANTEED FOR A LIFETIME</u> and are <u>CERTIFIED 100% ERROR FREE</u>. Both Verbatim and KAO double sided, double density disks are recognised as being of the highest quality in magnetic media

	VERBATIM BULK	KAO BRANDED
10	£4.99	£6.99
25	£10.99	£13.99
50	£19.99	£25.99
100	£36.99	£44.99
200	£69.99	£84.99
300	£99.99	£124.99
400	£123.99	£159.99
500	£144.99	£189.99
1000	£269.99	£329.99

Disk Labels....500......**now only £6.99**
Disk Labels...1000.....**now only £9.99**

EMULATORS

KCS Power board PC/XT emulator comes with Dos 4.01..................**only £214.99**

AT Once emulator turns your Amiga into an IBM AT compatible.............**only £169.99 !**

SUPRA RAM EXPANSIONS

The ultimate Amiga A500 expansion. Take your A500 up to 9 Mb Fits onto the side expansion port Auto configured, <u>no</u> software patching

8 Mb pop to 2 Mb......£184.99
8 Mb pop to 4 Mb......£234.99
8 Mb pop to 8 Mb......£329.99

1.5 MEG RAM EXPANSIONS

Take your A500 up to 2.0 megs total RAM with this easy to fit board

UNPOPULATED.............£32.99
512K POPULATED..........£52.99
1 MEG POPULATED.......£69.99
1.5 MEG POPULATED....£84.99

* Gary board supplied with all expansions boards. If you have a Kickstart 1.2 Amiga the board will be incompatible when populated to 1.5 Mb

512K RAM EXPANSIONS

Top quality Protar memory expansion for the A500 complete with battery backed clock and on/off switch that can be mounted externally for easy access.

This RAM expansion will not in any way invalidate your Amiga warranty!!

only £29.99

MAIL ORDER ?

Order by telephone quoting your credit card number. If paying by cheque please make payable to ***FIRST CHOICE***. In any correspondance please quote a contact phone number

TEL. 0532 637988

FAX 0532 637689

PLEASE ADDRESS ALL CORRESPONDANCE TO :

DEPT AS, UNIT 8
ARMLEY PARK COURT
OFF CECIL ST, ARMLEY
LEEDS LS12 2AE

WHY FIRST CHOICE ?

**** All prices include VAT and fast delivery***
**** All products are genuine UK specification***
**** Free postage UK mainland***
**** Next day delivery only £3.00 extra !***
**** Goods despatched same day as order unless otherwise stated.***

Personal Cheques Will Require Clearance Before We Can Despatch Your Goods. All Prices Correct At Time Of Going To Press. All Items Listed In Our Advertisments Are Ex Stock Ready To Ship Unless We Advise Otherwise. Computers Are Always Tested Before Despatch. E&OE.

MJC COMPUTER SUPPLIES

Suppliers of Discount Software since 1984

Educational, Local Authority and government orders welcome. Overseas orders please call or write for quotations. All goods subject to availability, prices subject to change without notice. E & O E.

Prices include VAT and delivery by post. Courier delivery available on any item £5.

TO ORDER: Please call the telephone number listed below to place credit card orders (Access/Visa) or send cheques/POs made out to MJC Supplies to:

MJC SUPPLIES (ASH)
Unit 2 The Arches, Icknield Way,
Letchworth, Herts. SG6 1UJ.
Tel: (0462) 481166 (6 lines)

PROTAR PRODUCTS

Protar are a well known German company who have now opened in the UK. They produce a range of quality products for the Amiga at very reasonable prices. All products are backed by an impressive 1 year REPLACEMENT warranty direct from the manufacturers. NOTE: Protar products due September.

PROTAR A500 HARD DRIVES

A range of drives from 20Mb to 200Mb all with an impressive list of features:

- Optional Ram expansion up to 8Mb
- Transfer rate greater than 1Mb/second
- Up to FIVE times faster than A590
- Drive disable switch
- External SCSI interface

PROTAR A500 HD 20Mb version	**£279.00**
PROTAR A500 HD 30Mb version	**£349.00**
PROTAR A500 HD 50Mb version	**£429.00**

FREE Courier delivery on Protar Hard Drives

PROTAR C141M MONITOR

Based on the Philips CM8833 the C141M comes with a variety of inputs and complete with leads.
MJC PRICE £248.00
FREE Courier delivery on Protar Monitors

PROTAR 1/2 Meg Memory Expansions

1/2 Meg internal (trapdoor) expansion, latest 4 chip design with battery backed clock.
MJC PRICE £27.95

SUPRA 500RX EXPANSIONS

New memory expansions for the A500 - plugs directly into the HD expansion port - NO INTERNAL CONNECTOR REQUIRED

SUPRA 500 RX EXPANSION 1Mb	**£119.95**
SUPRA 500 RX EXPANSION 2Mb	**£189.95**

GOLDEN IMAGE OPTICAL MOUSE

A true optical mouse - no more balls! includes special optical mouse pad
MJC PRICE £34.95

A1500/2000 PERIPHERALS

SUPRARAM - add on Ram cards with space for up to 8Meg of extra Ram.

SUPRARAM with 0K fitted	**£84.95**
SUPRARAM with 2Mb fitted	**£159.95**
SUPRARAM with 4Mb fitted	**£225.00**
SUPRARAM with 8Mb fitted	**£349.95**

SUPRA HARD DRIVES

Using the fast Wordsync 2000 controller and quality Quantum drive mechanisms.
(A1500/2000)

SUPRADRIVE 52Mb (11ms)	**£389.95**
SUPRADRIVE 105Mb (11ms)	**£529.95**

GVP SERIES II HARD DRIVES

Quality drives with the ability to add up to 8 Meg of extra Ram on board.
(A1500/2000)

52 Meg (11ms) version	**£419.95**
105 Meg (11ms) version	**£539.95**

GVP Series 2 controller board **£199.00**

SIMMS Modules - **£79.95** per 2 Meg

MICROWAY FLICKER FIXER

Eliminate interlace flicker from your A1500/2000 - requires Multisync or a 31MHz scan monitor.
(not PAL overscan)
MJC PRICE £139.95

PANASONIC C1381 MULTISYNC MONITOR

At last a quality multisync monitor at an affordable price. Works in ALL Amiga modes ideal for use with the Microway Flicker Fixer. A quality product backed by TWO YEAR on-site maintenance.
MJC PRICE - CALL

GOLDEN IMAGE HAND SCANNER

Quality 400 dpi scanner with powerful Touch Up enhancement software.
MJC PRICE £139.95
LIMITED STOCKS!

WORDPROCESSORS

Kind Words 2	**£29.95**
WordWorth	**£84.95**

PROTEXT Version 5
A very fast command based package now with 110 000 word Collins Dictionary, Mail Merge and up to 36 files open plus much more - call for details. (1 Meg)
MJC PRICE £99.95

PROTEXT V4.3	**£64.95**
PRODATA AMIGA	**£55.95**

DESKTOP PUBLISHING

Pagesetter 2 - (Free Clip Art)	47.95
Pagestream V2.1	139.95
Pro Page V2.0	169.95

The above programs all require at least 1 Meg and 2 drives/Hard recommended.

VIDEO TITLING/PRESENTATION

Big Alternative Scroller	42.95
TV Show - IFF slide show	54.95
TV Text Pro - quality fonts	79.95
Broadcast Titler II	169.95
Broadcast Font Pack (10 Fonts)	84.95
Broadcast Font Enhancer Pack	84.95

ZVP VIDEO STUDIO

Great Video Production package - call for details (requires 1 Meg + 2 drives)
MJC PRICE £89.95

RENDALE 8802 GENLOCK

Great value Genlock offering both Foreground and Background modes.
MJC PRICE £159.95
8802 MODE SWITCH BOX - £29.95

GRAPHICS

Pixmate	34.95
Digi Paint 3	44.95
3D Construction Kit	37.95
Digiview 4 Gold	89.95
Deluxe Paint 3	57.95
Disney Animation Studio	74.95

DELUXE PAINT 3 VIDEO TUTORIAL

Nearly 3 hours of 'how to' with DPaint 3
MJC PRICE £17.95

AMOS - The Creator

AMOS V1.2 - The Language	**£33.95**
AMOS COMPILER - now available	**£21.95**
AMOS 3D - now available	**£24.95**

SOUND/MUSIC

MasterSound Amiga	£29.95
Techno Sound Turbo (Stereo)	£29.95
Harmoni - Sequencer	£29.95
Alter Audio - Midi Starter Pack	£79.95

THE MIDI CONNECTOR

Featuring Midi In, 2 x Midi Out, Midi Thru and Serial port Thru + 2 cables.
MJC PRICE JUST £14.95

MISCELLANEOUS

INFOFILE	29.95
MAXIPLAN PLUS	39.95
SUPERBASE	49.95
SUPERPLAN	49.95
PERSONAL FINANCE MANAGER	22.95

NAKSHA UPGRADE MOUSE

280 DPI with FREE Mouse House + Mat now also includes free Op Stealth game
MJC PRICE £21.95

SQuik - Replacement Mouse

Same spec and design as Naksha mouse
MJC PRICE £14.95

CUMANA CAX 354 DISK DRIVE

Quality Brand name 3.5" second drive includes thru port, disable switch and No Hassle 1 year guarantee.
INCLUDES FREE VIRUS-X UTILITY
MJC PRICE £59.95

AMIGA EDUCATIONAL

Fun School 2

Fun School 2 under 6	12.95
Fun School 2 6 to 8	12.95
Fun School 2 over 8	12.95

Fun School 3

Fun School 3 under 5	15.95
Fun School 3 5 to 7	15.95
Fun School 3 over 7	15.95

LCL Software

Primary Maths Course	19.95
Micro Maths GCSE	19.95
Micro English GCSE	19.95
Micro French GCSE	19.95

Kosmos Software

Junior Quiz 6 to 11	14.95
Senior Quiz 14+	14.95
French Mistress	14.95
German Master	14.95

Learn to Read With Prof - by Prisma, is designed to teach a sight vocabulary of 63 words and is aimed at 4+ years. The pack includes 5 small reading books and a cassette.
MJC PRICE £19.95

VIDI AMIGA

VIDI COLOUR SOLUTION

Vidi Colour package - including Vidi Digitiser, Vidichrome and Photon Paint
MJC PRICE £95.00

RGB SPLITTER - for use with Vidichrome or Digiview. (includes PSU)
MJC PRICE £59.95

COMPLETE COLOUR SOLUTION

Package includes Vidi Amiga, Vidichrome and the RGB Splitter for a complete colour digitising outfit. NOTE: For best colour pictures you require a video camera or perfect still frame VCR
MJC PRICE £139.95

VISA **Remember - prices include VAT & delivery!** Access

continued from page 60

four speed selection buttons (2,400 - 19,200). I first tried selecting 2,400 baud and, while in *Ncomm 1.92*, pressing AL. Random characters were sent to me, without my typing anything. When pressed, ST flashes the red TEST indicator.

Automatic dialling gives "Modem not responding", and manual dialling does nothing, not even lighting up CD. I have tried dialling with just the 2,400 button pressed in, and pressing it upon the phone 'squeaking' at me.

The telephone lead comes from a splitter (telephone and modem in the same socket), into the PSTN socket. If I plug the phone into the TELE socket, it goes dead. The serial cable is home-made, pins 1 - 8, 20 and 22 are connected. Should pins 20 and 22 be crossed?

I have swapped the modem with the other in the shop and it is exactly the same. The back of it has three sockets – PSTN, TELE and PC. Should I be using the PC connector? I have used a friend's 1,200/1,200 modem, and it works perfectly.

How about a modem phone numbers section?

Ian Ozsvald
Thornton Heath
Surrey

Bad news, I'm afraid. According to the CIX comms crowd, the Datel 4192AX is a leased-line synchronous modem designed for short distance links. In plain language, it won't work on a normal telephone line, nor can it be driven by the Amiga's asynchronous serial port. Return it and ask for your money back, and next time please remember that there's really no such thing as a bargain if you don't get a manual with your hardware.

Your serial cable sounds fine, though – lines 1-8, 20 and 22 should all be connected straight through.

It is an extremely difficult task to produce a comprehensive BBS list in any magazine, since it's a cert that at least one of the boards will change or die before the list gets printed. The best attempt is in our sister magazine, *New Computer Express*. ***SCR***

FAN NOISE RE-VISITED



Is there an alternative fan to the A590's which is quieter? Is there an extension cable that can be plugged into the side port so that the A590 can live with all the other boxes on the floor?

Paul Mathews
St. Leonards-on-Sea
East Sussex

No and no – howzat! Actually, my colleague Jolyon Ralph suggests the best method to silence an A590 is to remove the fan altogether – although you will also need to leave the lid off to provide adequate cooling. It isn't really possible to extend the expansion bus more than a few inches because the data lines tend to get confused. A better method would be to buy, say, an A1500 or Bodega Bay expansion box and put everything inside. ***MS***

UPGRADING RAM



I currently own an Amiga A500 with 2Mb RAM and am thinking of upgrading, but not really sure of which way to go – a Commodore A1500 or the Checkmate upgrade. The reason for upgrading is to make use of an accelerator board, hard drive and 1Mb Chip RAM in program such as *Vista*, *Mandel Mountains* and DTP. *Protext* and *Superbase Personal 2* are also used a lot. I was thinking in terms of a CSA Mega Midget Racer and a Quantum 52Mb hard drive. So here's hoping you can answer a few questions:

1) Do either of the A1500s have an advantage over the other?

2) To change my machine to 1Mb Chip RAM, other than changing the chip, are there any modifications which need to be done?

3) How many expansion slots do the two units provide?

4) I have been told that using the expansion slots on the Commodore A1500 before the guarantee runs out will invalidate it, is this true?

5) In the time the A1500 has been out, have there been any changes in the specs?

6) If I start off with an accelerator board without any extra 32-bit memory, will it use any extra RAM I already have? Will this make the accelerator slower than when working with 32-bit memory?

7) Considering the programs I am likely to be using should I get a board with a maths co-processor? Also, would an 'Economy' Mega Midget without a Memory Management Unit (MMU) be OK?

John Hayes
Edmonton

1) The Commodore A1500 is an Amiga 2000 with two floppy drives. It has a decent-sized power supply, lots of slots, three drive bays and 1Mb of Chip memory. The Checkmate unit has the obvious advantage that you won't need to sell your A500.

2) To upgrade your machine to 1Mb of Chip RAM requires a new Agnus chip (8372) and a minor soldering job to the motherboard.

3) The Commodore unit has five Amiga slots and four IBM-style slots for use with the Bridgeboard. The Checkmate comes with no slots, but they are available as an option. Be warned, though, that most expansion board manufacturers will not support boards fitted into any Amiga 500 expansion like the Checkmate A1500 or the Bodega Bay.

4) No, I have been assured that the warranty seal on the back of the Amiga 1500, 2000 and 3000 is only for distributors to identify machines that have been returned by dealers as dead-on-arrival. The warranty-void sticker on my 3000 lasted about 20 seconds after unpacking the machine. You are perfectly entitled to open up your machine to install expansion boards with no worries about invalidating your warranty. If you started pulling chips out of the motherboard and soldering things on it, of course, then that would be a totally different matter.

5) No, the A1500 hasn't changed in any way at all since it was first released. New machines being manufactured by Commodore at the moment will apparently have the Kickstart 2.0 chip installed. (Although Commodore couldn't confirm this fact to us at the time of going to press.)

6) Yes, you really need 32-bit memory for an accelerator to run at anywhere near full-speed. It will work with 16-bit memory, but at less than half the speed of 32-bit RAM.

7) For *Vista* and *Mandel Mountains* a maths co-processor is a very great advantage indeed. The memory management unit is not going to be essential for the software you are using at the moment, but future versions of the Amiga's operating system will almost certainly utilise an MMU to provide memory protection and virtual memory, and will possibly require one. ***JR***

continued on page 66

JARGON BUSTING

A1500 + Bodega Bay – As well as being a model of Amiga, the A1500 is also the name of a third party expansion casing, as is the Bodega Bay, designed to fit on to the Amiga 500 and increase its expansion capabilities.

A590 – The standard Commodore hard drive for the Amiga. A hard drive has a much greater capacity than a floppy disk drive, and is faster. But it does cost rather more.

Accelerator board – A device which either includes a central processor like the Amiga's, or a more advanced one in the same range, but operating at a higher speed. An accelerator is useful for calculation-intensive applications such as 3-D rendering.

Agnus chip – The custom chip in the Amiga dedicated to graphics. The first three versions – the 8361, and the 8370 and 8371 Fat Agnus – can access 0.5Mb of Chip RAM. A later version, the 8372a (Fatter Agnus), can access 1Mb.

BBS – Bulletin Board System, contacted via a modem (*qv*) and telephone line. The name comes from the American college bulletin board (the cork and drawing pins type) which is a traditional meeting and trading place.

Chip RAM – This is the area of the Amiga's memory directly accessible by the custom graphics and sound chips. Originally a maximum of 512K, newer machines fitted with the Fatter Agnus graphics chip can access 1Mb, allowing smoother animations and more screens to be displayed at once. The new Amiga 3000 comes with an Agnus chip capable of addressing 2Mb of Chip RAM.

Kickstart – The most central part of the Amiga's operating system. These days it is held in ROM, so that it is immediately present when the machine is switched on. A1000s have Kickstart on a floppy disk, meaning that on power-up this disk must be inserted before the Workbench disk. The latest version, Kickstart 2.0, is currently available only for the A3000, and offers many improvements.

Modem – A device which connects to the Amiga's serial port and converts computer signals into a suitable format for transmission along a phone line. Likewise, it will convert incoming signals back into a form the computer can recognise. External modems will work with any computer, although it is possible to buy Amiga-specific cards to plug into the A1500 and A2000, thus keeping the serial port free for something else.

continued from page 65

WHAT IS AMOS?

I have had my Amiga for about a month now, and am going through much confusion. I find reading your magazine very useful, but one question still remains unanswered: what is AMOS?

V Lloyd
Doncaster
South Yorkshire

AMOS is a programming language, rather like Basic. Using AMOS, it is possible to write a series of instructions which the Amiga will follow. The instructions must obey certain rules of syntax – spelling, word order and so forth. Each programming language has its own rules of syntax. The 'meaning' of the program you write is the overall process that the Amiga goes through as a result of following your instructions.

Programming languages are necessary because computers understand a very primitive and difficult to read language known as machine code. AMOS acts as a translator, converting instructions written in something approaching English (but by no means as complex or subtle as English) to the machine language that the Amiga can follow.

AMOS is one of a variety of languages known collectively as Basic. Each version of Basic has its own idiosyncrasies. AMOS, for instance, is especially weighted towards the production of graphics, music and animation. As a consequence, it is used a great deal to write simple games. Don't, however, get the impression that it can be used to produce professional-quality games – it simply doesn't have the speed. The translation that AMOS performs slows down the Amiga, and this translation occurs every time that your program is executed – every time that you tell the Amiga to follow the set of instructions you have written. ***CR***

INTERFACING AMIGA

My first question concerns the communication between computers using the RS232 port. I would like to know how I can connect my Amiga up to a friend's Atari ST. I know that this is possible and was wondering if you could help me by printing a wiring diagram for the cable. If you were to do this, then could you please recommend some software (preferably PD) for use with such a link.

Would I be able to download a disk from his ST and use the programs on it? Would it be possible to transfer data files and picture files between computers?

Secondly, I own an Amstrad PC 1512 HD20, with a 20Mb hard card inside. Since it is now unused, I was wondering if there was any chance that I could remove the hard card and connect it to my Amiga. I know that some sort of interface would be required, and would be grateful if you could offer any advice as to how to connect it to my computer.

Graham Hayes
Leicestershire

JARGON BUSTING

Array – A type of variable common to most languages, whereby several variables are grouped under the same name, and each individual variable (called an array element) is accessed via an integer index value, usually placed in brackets after the array name. Arrays are often used in code in which a loop is created by incrementing a variable. This variable can then be used to access each element of the array in turn.several new features over earlier versions.

IFF – Interchange File Format is a means by which data from different graphics or sound sampling programs are saved in a compatible way. It allows data to be easily exchanged between programs and avoids the situation on, say, the PC where dozens of different graphics packages save data in incompatible formats.

RS232 – A standard serial interface port, used for communicating with other computers, connecting printers and connecting to modems.

SCSI – Small Computer Systems Interface is a standard used for connecting hard drives, CD-ROM drives, tape back-up units and other such devices to computers.

Virus – A small program that can lie hidden in memory or on a disk, duplicating itself on to any disks inserted in the machine and generally causing havoc. There are many virus killers available in the public domain designed to deal with this menace.

To make a null-modem cable (that is the name of a device to link two computers) you'll need two 25-way RS-232 sockets and some cable – telephone cable is cheap and works fairly well.

Dig out your soldering iron, and connect the following pins:

Pin 7 — System Ground — Pin 7
Pin 2 (TXD) ——— (RXD) Pin 3
Pin 3 (RXD) ——— (TXD) Pin 2

With both machines switched off, connect them with the cable, and gets some terminal software running. I'd recommend *AZComm* (Fish Disk 171) as it's small, fast and free. I'm not sure about the Atari side, but comms software such as *UniTerm* or *VanTerm* should work, as long as they supports the Z-Modem protocol.

Set both sides to 9,600 baud full duplex, 8 data bits, no parity, one stop bit and no flow control. You want to use Z-Modem Send from the Atari, and Z-Modem Receive on the Amiga, and the files should come across the line at just under 1K per second. For details of controlling your Amiga from the ST, check out this month's AmigaDOS column, which details how to do just that. You'll find it on page 105.

You won't be able to run any of the Atari programs without an emulator, but there are various graphics converters for both machines which allow pictures to be exchanged.

Connecting a PC hard drive to the Amiga is not easy. There is no hope if it's one of the really old SASI drives used in some 1512s, and even if it's a ST-506 drive you may have extreme difficulty connecting to an A500. Almathera Systems (☎ 081-683 6418) may be able to help you out. ***SCR***

CROSSWORD PUZZLE

I have recently bought AMOS and wondered if you could help me with a few problems I have been having with it. My problems are the following:
1) I can't get AMOS to list my programs. When I type LLIST as it says in the manual, the reply is "Illegal direct mode". How can I send my programs to the printer?
2) I have written a program to design crossword puzzles. They are created using the box and paint commands. How can I save the final crossword to disk?
3) Still with the same program, how can I print them?

Gareth Downes-Powell
Broadstairs
Kent

1) For some reason the LLIST command doesn't work. You can get around this by highlighting your program as a block and printing it. To do this, go to the top of the program and press the right mouse button. Now, with the mouse button still pressed, move to the end of the program. It should all be highlighted.

Go to the top of the screen and click with the right mouse button on the Blocks menu gadget. Then click on the Block Print gadget, and all of the highlighted text will be printed.
2) It's difficult to give you accurate advice about saving the crossword, since you haven't told me how your program stores the crossword puzzle internally. I'm assuming that you have the words stored in two arrays, A$() and D$(), representing words across and down. The size of these arrays will be governed by the number of possible words in your crossword. This can be represented by a variable, WORDS, which is initialised at the beginning of the program to, say, 20.

If there is a word at three across, then you would place that word in A$(3). A word at twelve down would be placed in D$(12). And so on. Any elements of the array that don't have words corresponding to them are left empty. As well as storing the words, you must also store the positions that they appear in on the crossword. You can use two numeric arrays for this, such as A(WORDS) and D(WORDS).

Saving the crossword to disk becomes a simple matter of saving these four arrays as a file. Some AMOS code to do it looks like this:

```
Open Out 1,"filename"
For I=1 To WORDS
 Print #1,A$(I),A(I)
Next I
For I=1 To WORDS
 Print #1,D$(I)
Next I
For I=1 To WORDS
 Print #1,A(I)
 Print #1,D(I)
Close 1
```

Obviously you must think of a filename to use when accessing your crossword. You will also have to include a disk name in the quoted part of the Open command if you want to save to a disk other than the one currently in the drive. Bear in mind that this process of saving the file will erase a previously saved file of the same name.

To recall a previously stored crossword puzzle is just as simple:

```
Open In 1,"filename"
For I=1 To WORDS
 Input #1,A$(I)
Next I
For I=1 To WORDS
 Input #1,D$(I)
Next I
```

```
For I=1 To WORDS
 Input #1,A(I)
 Input #1,D(I)
Next I
Close 1
```

With just this information it is a simple matter to re-construct a crossword grid. You start off assuming that all the squares in the grid are blacked out. Then, working your way through each of the across and down string arrays, you can find which squares should be left open, and draw each of these in white. Here's a section of AMOS code to do just that:

```
Cls 2
Ink 0
Polygon 0,0 To X*16,0 To ↵
X*16,Y*8 To 0,Y*8 To 0,0
Ink 2
Pen 0 : Paper 2
For I=1 To WORDS
 If A$(I)<>""
  Polygon A(I)*16,D(I)*8 To ↵
A(I)*16+Len(A$(I))*16,D(I)*8↵
To A(I)*16+Len(A$(I))*16,   ↵
D(I)*8+8 To A(I)*16,D(I)*8+8↵
To A(I)*16,D(I)*8
 End If
 If D$(I)<>""
  Polygon A(I)*16,D(I)*8 To ↵
A(I)*16,D(I)*8+Len(D$(I))*8 ↵
To A(I)*16+16,D(I)*8+Len(   ↵
D$(I))*8 To A(I)*16+16,D(I) ↵
*8 To A(I)*16,D(I)*8
 End If
 If(A$(I)<>"") or (D$(I)<>"")
  Locate X Text(A(I)*16),Y  ↵
Text(D(I)*8)
  Print
Right$(Str$(I),Len(Str$(I))-↵
1);
 End If
Next I
```

The arrays A() and D() contain the positions within the crossword grid where the words appear, numbering the top left column with coordinates (0,0). The length of space necessary either across or down to accommodate the words is determined by using the string function 'Len()' to get the length of the words. Since the characters are eight pixels wide by eight pixels high, each of the squares must be at least eight by eight. In this example I've made the squares 16 pixels wide, so that numbers larger than nine can be printed in them.

Notice when printing the number corresponding to the words that it is necessary to convert the number to a string and to drop the first character in the string. This is because AMOS puts a space at the beginning of positive integers when it prints them.

You may well want to save a set of clues along with the actual words and their coordinates. In this case, you simply need two more string arrays to hold the across and down clues. They can be saved and loaded in exactly the same way as the rest of the information, as outlined in the code fragments above.

3) Probably the easiest way to get a printout of your finished crossword is to display it on the screen, save the screen as an IFF file, load it into a program such as *Deluxe Paint* and print it from there.

After your code which displays the crossword, put the line:

```
Save Iff "filename"
```

You can then load the screen into *DPaint* and print it out. ***CR***

REPLAY WON'T PLAY



Datel's Action Replay cartridge refuses to work properly with the A5000 accelerator card located in my Amiga 500. By removing the A5000 the cartridge works fine. The A5000 has given me no other problems in the seven months I have used it.

My system has 4Mb of RAM (located on the accelerator card), another 0.5Mb underneath the trapdoor, an external disk-drive and 1Mb of Chip RAM.

Dean Simmonite
Doncaster

Datel's cartridge isn't very well known for it's compatibility; indeed, I have been waiting since February for Datel to inform me when they have a cartridge that actually works properly with other add-ons. The current Action Replay II cartridge will not work with most hard drives and it will not work with more than 2Mb of Fast memory. It doesn't work with accelerators either, as you've found out. Hopefully Datel will give their German programmers a kick and tell them to do the job properly. ***JR***

DOUBLE VISION



At present I have an A2000 with a 1084S monitor which is connected to both the A2000 (RGB connector) and a video deck (CVBS connector), allowing me to happily switch between the two. I also have an AT Bridgeboard and a VGA card and would like a monitor which will give me VGA on the PC side and flicker-free resolution on the Amiga side, while still being able to work with the video deck.

In the Bridgeboard manual it says that you must have two monitors if you want VGA on the PC side, but I don't see why this can't be overcome. Could you recommend a monitor for my requirements?

Paul Gunning
Eastbourne

The VGA and flicker-free input is relatively easy. You'll need a multi-sync monitor, a switcher box and the correct cabling for all your connections. Connect both the VGA output and the flicker-fixer output to the switch box. Connect the output from the switch box to the monitor. Use the switch to go from VGA to flicker-free and back.

I'm not sure if there are any multi-sync monitors which will also take composite video. If you can find one, then your problem is solved. If not you'll have to code the video signal into RGB and then add it to your switch box for output to the multi-sync as RGB. So, yes, the problem could be overcome, but since you have a 1084 anyway, why not use it for the video signal? Wouldn't that make life simpler? ***GW***

PHONE QUERIES



While reading *How to Get Started with Modems* by Jim Kimble, I read about a system operated by the US phone companies called 'TELENET'; by subscribing to the system you can phone anywhere in the nation for a standard hourly rate. It also talked of a system called PC Pursuit, whereby you can phone as many times as you want to any major BBS for $25 a month (off-peak). Are there any systems like this operated in Britain, and if not why not? Surely it would make an interesting hobby a lot more affordable and fun, especially in the light of BT's future price rises. What is PSS – is this BT's equivalent?

I purchased a copy of *NComm*, which I copied on to a blank disk. This version has a virus checker on the front and when loading the copy it warned me that a virus was present. When I put it into Kill Virus mode it claims it's dead but when I re-boot I am told that a virus is still present. If I don't reset after killing the virus it's all OK. Is the virus still present? Am I transferring it to all the BBSs I phone?

Michael Tipping
Snitterfield
Warwickshire

PSS (Packet Switched Stream) is a system allowing long-distance data connections to be charged at local rates. It requires the caller to have a Dialcom PSS account (£60 registration plus £15 a quarter), and the target system needs to have a PSS address. It's expensive, not widely used, and high speed support is not always available locally.

PC Pursuit is a way of saving the user money. Since BT is very nearly a monopoly in this country, it would not be in its interests to offer such a system. Your best bet is to get a Mercury account, since long distance calls are much cheaper with it (as long as you spend more than about £100 per quarter on phone calls).

It sounds like you've got a link virus on some of the files on your boot disk. Get a recent virus killer and let it scan through every file you've got. Anything that you have run and then uploaded may carry this virus, so it's in everyone's interest that you get rid of it. ***SCR***

THE SCSI CONNECTION



I am presently considering buying a hard disk for my A500. A lot of drives now offer SCSI interfaces. Does this mean I can connect SCSI devices – CD-ROMs and so on – to it? What about other SCSI hard drives? If I buy an A590 will I be able to connect a SCSI drive to it at a later date? If so, will I need a controller for the new drive or would the existing A590 cope with it?

Chris Thornley
Beaworthy
North Devon

Most hard drives for the Amiga 500 have a SCSI port on the back. If a drive has a SCSI port and the interface supports the SCSI-Direct protocol (the A590 does), then you can get almost any SCSI device (CD-ROM, tape streamers, magneto-optical drives and so on) working with it. They will need special driver software to control them, though. Other SCSI hard disks can be added at a later date without any problem; the SCSI controller is embedded on the drive itself, so all you need is a drive, a power supply and case, and the relevant cable. ***JR***

IMAGINATIVE DIFFERENCE



I was pleased to see the review of *Imagine* in *Amiga Shopper* Issue 4. However, there seem to be differences between my copy (v1.0) and the review copy. I read about items such as the rotate effect, camouflage and other items which don't exist in my copy. Have I got an earlier version?

I also have a problem getting transparency effects to work. How about a tutorial section or tips for *Imagine* users?

Is there anyone who can provide me with suitable scenes (raytrace clip-art) for rendering in *Imagine* and if so, who?

A Jones
Wrexham
Clwyd

Yes, you're right. I was reviewing *Imagine 1.1* (and forgot to say so).

continued on page 69

continued from page 67

Upgrading is easy – send your original disk and £3.50 to Alternative Image, 6 Lothair Road, Leicester LE2 7QB and you will get an upgrade to version 1.1. It may be worth waiting a few more weeks, though, as v1.2 is due and is obviously going to be even better.

To get a glass-like effect, try the following settings:

```
Colour 255/255/255
Reflect 0/0/0 (more if you wish)
Filter 255/255/255
Index of Refraction 1.67 (for glass)
```

Try using these settings to make a lens in front of a chequered panel. Remember to keep the reflection values quite low, though, as otherwise all you'll see is a reflection of the world on the glass object.

Lastly, I am not aware of any object libraries specifically for *Imagine*, although there are disks of *Sculpt Animate* objects (for instance, the series by Antic) which can be converted for use in *Imagine* by using the *Turbo Silver 3* converter with Syndesis' *InterChange* object conversion software. ***GW***

SAFE PARKING



When I play a game on my A500, must I afterwards boot up with Workbench to park the heads of the A590, or will they not have moved from the parking area as the computer was booted up from a floppy in the first place?

Gordon J A Smith
Irvine
Ayrshire

The simple answer, I'm afraid, is yes you should park you drive's heads – although things tends to get a bit more complicated if you are still using Kickstart 1.2 or a special (third-party) hard drive. If you have 1.2 Kickstart, the drive stays parked until you reboot the startup floppy. Under 1.3 however, the Kickstart ROMs auto-mount the drive and unpark the heads as soon as the machine is switched on. If your drive mechanism has been upgraded to, say, an auto-parking Quantum this problem does not occur.

A quick solution is to ensure that the 'park' icon is in the main directory of a boot disk and create a Startup-sequence to specifically park the heads.

For a 1.2 Kickstart you would need to add the following before and after the line BINDDRIVERS on the startup disk:

```
copy C:ASK to RAM:
BindDrivers      ; the                ↵
existing BindDrivers command
Park
RAM:ASK "Heads now parked.  ↵
Switch off now."
```

For a 1.3 Kickstart machine you should use the following instead; BindDrivers is not required, so place this just after SetPatch.

```
SetPatch >NIL:
copy C:ASK to RAM:
Park
RAM:ASK "Heads now parked.  ↵
Switch off now."
```

In either case, you can continue the Startup-sequence by pressing [Return] at the prompt. ***MS***

DESIGN DILEMMA



I have been interested in buying a CAD package for my Amiga. I have not seen any CAD packages actually working on the Amiga, nor have I managed to buy any demos, so I cannot make an informed decision on which one to buy. My decision will be influenced by the following factors and preferences:

1) My existing Amiga set up is an Amiga A500 with 1Mb of memory and a second floppy disk drive.

2) If possible, I would like to draw circles, arcs, diagonals and so on without jagged edges and produce printouts on my Epson LX80 that are good enough for photocopies and OHPs.

3) The software must be able to produce windows, pull-down menus and its own icons for ease of use as I cannot yet use the Shell system.

4) Accurate metric scaling is important.

5) I would like to import files into *Kindwords*.

Tony Gorman
Moulton
Northampton

At the risk of sounding repetitive, I'd recommend *X-CAD Designer* (published by Applied Vector Technology, ☎ 081-573 9694). It doesn't produce icons for its files, but it is a powerful 2D package that you won't outgrow quickly, if ever.

X-CAD will save IFF bitmaps which can be loaded into *Kindwords* but the print quality will be poor, since the screen resolution is too low for any great detail. The normal dot-matrix output from *X-Cad Designer* is excellent, though. ***SCR***

WHO IS GARY?



I recently upgraded my A500 to 1Mb. However, I soon realised that I really need even more memory. I saw an advertisement for the Megaboard from Evesham Micros which fits in between the 512K upgrade and the Amiga to give a total of 2Mb. The documentation states that installation requires connection to the Gary chip.

Exactly what is the Gary chip, what does it do, why must the Megaboard be connected to it and how does the Megaboard connect to it? Is the Megaboard a viable investment, or should I look elsewhere for another expansion?

Daniel Simmonds
Colchester

The Gary chip in the Amiga 500 controls the memory and the memory expansion. When the Amiga 500 was designed it was thought that 1Mb of memory would be enough for most people (remember that the Amiga 1000 was sold in the US with 256K initially!). The expansion slot was therefore only designed to accept 512K of extra memory. Some companies have found that by connecting a few extra wires between their board and the Gary chip they can get a lot more memory in the slot, particularly as modern expansions use less chips and are therefore smaller. To fit the Gary extender you will have to open up your Amiga 500 (and this will invalidate your guarantee), remove the metal shielding and carefully remove the Gary chip – which can be done with two flat-bladed screwdrivers. You insert the chip into the connector, and plug that connector back into the motherboard. It's a very simple job; if you can wire a plug you can put the Gary adaptor in. ***JR***

JARGON BUSTING

CAD – Computer Aided Design applications provide designers with the graphical facilities to design buildings, circuit boards and so on.

Park – The process of moving the read/write head of a hard drive away from the disk, so that no damage can be incurred to the disk's surface while it is not in use.

ROM – Read Only Memory is used to store essential programs such as Kickstart and many of the library routines. These do not have to be re-loaded each time the Amiga is switched on because ROM retains its contents without power. No new information can be written to ROM, hence the name Read Only.

PC TO AMIGA GRAPHICS



I have access to a high-quality scanner, and would like to use it to produce copies of photographs for my Amiga at home. The only snag is that the scanner is attached to an IBM machine. I can save images to a 3.5-inch disk and read them into the Amiga (using *CrossDOS*) without problems. However, although the file is then available on an AmigaDOS disk I cannot get Amiga graphics or DTP programs to recognise them as graphics files.

I am quite prepared to write a conversion program, but I don't know the format of either the TIFF file produced by the IBM or the Amiga files. Presumably there are some sort of headers which give details of the size of the image, number of bitplanes and so on?

John Cook
Portsmouth
Hants

The problem you've got is easy to explain but not quite so easy to solve.You have moved across TIFF graphic files. All Amiga graphics software uses a picture file format which forms part of the IFF standard so Amiga graphics and art programs are not going to be able to recognize or do anything with your pictures until you've converted them into IFF form.

IFF (Interchange File Format) is a standard devised by Electronic Arts and adopted by Commodore and a complete description of the IFF standard could fill this magazine from cover to cover for the next year! I can, however, give you a rough idea of the layout expected, and point you in the right direction as far as the documentation goes.

The following details concentrate exclusively on the part of the IFF standard relating to the storage of two-dimensional raster graphics images – that is, pictures.

Such raster images are stored using a form known as an interleaved bitmap. The picture data itself is usually compressed using a technique called ByteRun1 compression and this compressed data, together with other IFF data items, constitutes the picture file as it would be stored on disk. The various file sections are known, in IFF speak, as 'chunks'. Programs that read IFF data look for and use chunks that they recognise and ignore those chunks that they cannot or do not wish to handle.

continued on page 70

continued from page 68

All IFF chunks start with a four-character identifier followed by a four-byte (signed 32-bit) count giving the size of the chunk's data (termed the 'chunksize'). Following this is the data itself and, if the chunksize is an odd number, a zero pad byte at the end of the data.

As a C structure definition a chunk can be described like this:

```
typedef struct {
    LONG chunkID;
    LONG chunksize;
    UBYTE chunkdata[ /* size ↵
given by chunksize */ ];
} Chunk;
```

A normal IFF picture file will start with the four letters FORM. This is a keyword that says that the datafile 'chunk', i.e. the file itself, describes a self contained IFF data section. For picture files the FORM type will be ILBM (the chunk identifier for an interleaved bitmap image with colour map), so the first twelve bytes of such a file would announce the fact that the file was an IFF file which contained a data section, would give the overall size of the chunk, and would identify the data as being ILBM type.

An ILBM chunk will have various 'property' chunks embedded within it. One of these property chunks is called the bitmap header. It is an IFF 'required property' – it must be present. The bitmap header (chunk identifier BMHD) describes the dimensions and the encoding of the image data to follow later. If we consider the IFF bitmap header chunk as a C structure you will be able to see what information those 20 bytes of header data contain:

```
struct {
UWORD    width,height; /* ↵
width and height of raster ↵
in pixels */
WORD     xpos,ypos; /* pixel ↵
position for this image */
UBYTE    planes; /* number ↵
of bit planes in image */
UBYTE    masking; /*indicates↵
masking technique in use */
UBYTE    compression; /* ↵
indicates the compression ↵
technique */
UBYTE    padbyte; /* unused ↵
at present - should be zero*/
UWORD    transparentColour;
/*transparent colour number*/
UBYTE    xAspect,yAspect; /* ↵
pixel width:height ratio */
WORD     pageWidth, ↵
pageHeight; /* source page ↵
size in pixels */
} BitMapHeader;
```

The first word gives the image width, the second gives its height. If, for example, the values were 0140 hex (320 decimal) and 00C8 hex (200 decimal) this would indicate a 320 by 200 pixel image. The next two words specify the x/y position of the image on the screen. Following this is an 8-bit unsigned value which indicates how many bitplanes the image contains.

The 'masking' value identifies one of four types of mask (this is an optional bitplane that tells us whether or not to move pixel data to a destination) being used. There are currently four possibilities:

0 indicates no mask.

1 indicates that a mask is interleaved with the bit plane data.

2 indicates that parts of the image are to be regarded as transparent.

3 indicates a *MacPaint* 'lasso'-type mask.

The unsigned byte which follows the mask byte identifies the type of algorithm which has been used to compress the data. If the value is zero, the data is not compressed, if the value is 1 it indicates that a standard Electronic Arts compression algorithm has been used.

The 'transparentColour' word specifies which bit pattern is to be considered as transparent and is only relevant if the mask flag is set to a value greater than one. Bytes 15 and 16 are the x/y aspect ratio and are available to help programs account for the different physical pixel width/height characteristics of not only the various Amiga screen types but different machine types as well. The last two fields give the pixel size of the original source page.

Other property chunks are often found embedded in a FORM ILBM. Here are some of the more important ones that you might encounter:

CMAP identifies colour map data.

GRAB identifies a handle or 'hotspot' point within an image.

DEST describes how to merge bitplane data into an existing picture that has more bitplanes available than the image data in question.

SPRT defines a sprite image.

CAMG an Amiga-specific chunk related to special display modes including Hold and Modify mode.

CRNG/CCRT These chunk types provides 'colour cycling' information.

Using the pixel data which is stored in an IFF BODY chunk is rather difficult because the bitplane data is 'interleaved' and usually compressed. The picture data is stored as a series of data items representing the video 'scanlines' with each scanline consisting of the data from each of the bitplanes, possibly followed by an additional 'pseudo-plane' used to defining the masking.

As you can imagine, IFF programming is not an easy subject to learn about. The place to look for detailed info is in the back of the Addison Wesley *Includes and Autodocs Rom Kernel Manual.* There is, incidentally, a lot of IFF support code floating around in the public domain.

As far as the TIFF format is concerned I'm sure if you contact Aldus, the standard's designers, on 031-220 4747 they'll be only too happy to help you get a copy

I would have thought that someone somewhere must have written a public domain TIFF to IFF picture converter already – so perhaps the best idea is to start contacting PD libraries. ***PAO***

JARGON BUSTING

Bitplane – A bitplane is an area of memory where every binary bit corresponds to a pixel on the screen. One bitplane represents a monochrome image, several can be overlaid to represent a colour or greyscale image.

IFF – IFF is short for Interchance File Format, and is an attempt to make sure that data saved out by one program can be read by another. Because the data is stored on disk in a specified way, you have a good chance of being able to read IFF sounds and images into a program other than the one in which they were originally created.

TIFF – Tagged Image File Format, another standard for storing images, which was specified by Aldus. Although theoretically as standard as IFF, in practice there are many small variations in the TIFF standard, so programs cannot always reliably read TIFFs created by something else.

MEDIA MIX-UP

I read recently about how to get back files on a disk after something else has been saved over them. It worked a treat, but my plea is this: is it possible to get erased programmes back from a VHS tape in a similar way?

Clayton Vaughn

I'm afraid that it can't be done. The reason for this is relatively simple, although both disks and video tape work by magnetism: information is stored by magnetising areas of the media in a certain orientation. The data can then be retrieved by reading the magnetic field which is given off from the media.

Writing new information over old means that the previous magnetic information on the disk or tape is lost forever. The reason that information from disks can be retrieved after it has been erased lies in the way that information is stored on them.

Unlike a tape, information is stored anywhere on a disk that there is space. In fact, different parts of the same program may physically be on entirely separate parts of the disk. When a program is erased from a disk, all that happens is that the header information – which describes the size and location of the rest of the file – is removed from the disk. Thus, there is no record on the disk that the file ever existed, and the space which it took up is essentially freed up.

Subsequent files saved on the disk are saved on unused portions of the disk. This includes the space previously taken up by the deleted file, but a disk is so big that the chances are this space will be untouched and the information will remain intact for some considerable time. Recovering an erased file becomes a matter of reconstructing the header information and retrieving the rest of the information from its various locations about the disk. Although by no means a simple task, there are a number of utilities around which can do this job for you, with varying degrees of success. The sooner a recovery is attempted after a file has been erased, the better the chances are. (If you ever want to do this, you can maximise your chances of success by ensuring that you don't save any other files on to the disk before you try to perform the recovery.)

A video tape, on the other hand, works in a sequential manner: rewinding a tape to the start and beginning to record means that the new programme will be recorded directly over the old one – erasing it totally, and with no hope of recovery. Sorry. ***CR***

Beginners start here

On the next three pages, technical editor Cliff Ramshaw answers a number of question frequently asked by those new to the Amiga

Having taken your brand new Amiga out of its box and plugged it in, you may well be more than a little bewildered at what confronts you. Although the machine is on the whole easy to use, there are a host of concepts to learn before you can make full use of it. Here we aim to outline some of these fundamentals to save you time and effort in coming to grips with your new machine; but always remember that the best way to learn about the Amiga is to experiment.

WHAT IS A COMPUTER?

A computer is a machine which will follow a set of instructions. It cannot think, but merely does what it is told. The instructions which it follows can come from a number of sources: instructions held internally, from the makers of the computer; instructions from a third-party program which is loaded in from a floppy disk; instructions from you, the user, typed in at the keyboard. The results, known collectively as 'output', are sent either to the screen, to the printer (if you have one) or to the disk in the floppy disk drive.

HOW DOES IT WORK?

Well, without getting carried away... at the heart of the machine is something called the Central Processing Unit (CPU). This is the bit which interprets the instructions sent to it (in a very simple language called 'machine code') and does what they tell it to. The instructions are held in the computer's memory.

MEMORY

The classic analogy is that of comparing memory to matchboxes. Imagine an incredibly long row of matchboxes, each numbered and each with something inside it. The contents of a memory location can be found or changed by referring to the number of the relevant matchbox, opening it and taking a look (or putting something else in). In practice, all that these matchboxes contain is numbers, but these numbers can be understood by the computer as words, pictures or sound (or indeed they can be kept as numbers). There are two main types of memory: RAM and ROM. RAM (standing for Random Access Memory) can be altered at any time by the computer. Once the power is switched off, the contents of RAM are 'forgotten'. ROM (Read Only Memory), on the other hand, is never changed, even when the power is switched off. It contains the basics of the operating system – the set of instructions which determine the overall behaviour of the machine at all times.

Memory is measured in units known as bytes. In every byte a number between 0 and 255 can be held. To hold bigger numbers, or more complex items of information, bytes are joined together into larger units. More conveniently, memory is spoken of in terms of kilobytes (K) or Megabytes (Mb). A kilobyte is 1,024 bytes; a megabyte is 1,024 kilobytes or 1,048,576 bytes. The reason that they are not nice round 1,000s and 1,000,000 lies in the organisation of bytes according to the rules of binary arithmetic, but that's not important right now...

FAT AGNUS

Possibly the most common question we get asked here at *Amiga Shopper* is about the Fat Agnus chip. Agnus is one of several custom chips inside the Amiga dedicated to producing graphics and sound. Whereas the Amiga's central processor can access all of the memory in the machine, the Agnus chip is limited to a much smaller portion, known as Chip RAM (since it can be accessed by the custom chips).

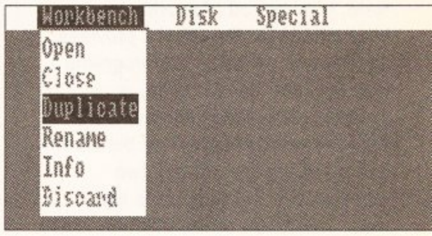
It is here that graphics information must be stored. Anything you see on the screen has an equivalent form inside the Amiga's memory, in Chip RAM, and it is Agnus (amongst others) that does the job of converting this information into the form of a picture.

The rest of the Amiga's RAM (as opposed to ROM) is termed Fast RAM. Whenever Agnus accesses the Chip RAM, it prevents the Amiga's central processor from doing so at the same time. Because much of what a processor does involves accessing memory, this has a tendency to slow the processor down. Memory which is not Chip RAM, on the other hand, can be accessed by the processor whenever it likes, without a speed penalty. And that's why it's called Fast RAM.

Now, the more Chip RAM, the better, since it means that more complex graphics can be on screen at once, bigger and smoother animations can be performed and more impressive sound samples used. The early Agnus chips could access 512K of Chip RAM, or half of a megabyte (the amount of memory that comes with an Amiga 500). This chip is numbered 8361, and was present on A1000s and early A2000 machines.

After that came the Fat Agnus, with a shape more like that of a square and a couple of extra features. This is the one in the majority of Amigas. Its part number is 8371 (or 8370 for the American version). Like its predecessor, it can access 0.5Mb of Chip RAM.

In the last year or so, Amigas have been released with an even newer Agnus chip. This is known as the Fatter Agnus, and it can



The Workbench menu; and someone's about to try duplicating a disk.

recognise 1Mb of Chip RAM. It has part number 8372a. An even newer version exists, accessing 2Mb of Chip RAM, but this is only available for the new Amiga 3000.

Hope that's cleared things up.

WHAT ABOUT DISKS?

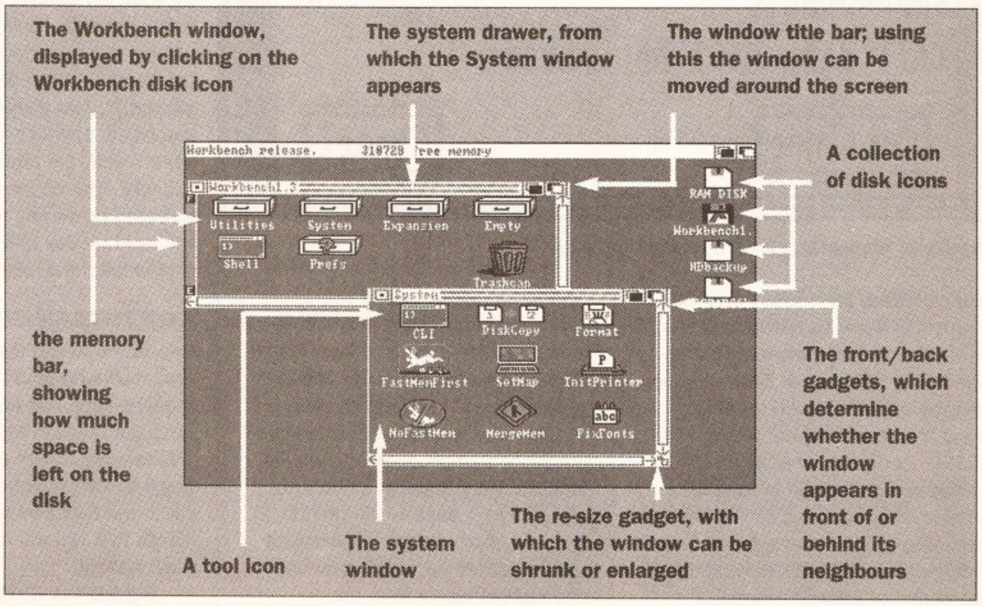
Disks can be thought of as removable memory. The difference is that the processor cannot directly access anything held on a disk. Before it can get its hands on it, the contents of the disk must be 'loaded' into the computer's RAM.

Information is stored on a disk in the form of files. A file is simply a grouping of related infomation with a name. The information is referenced by using the file name.

INFORMATION

Two types of information may be held in memory and on disks. The first type is the information which makes up a program. A program is a collection of instructions for the computer to follow. As well as the operating system, which is nearly always present, the Amiga may have several programs 'running' inside its

continued on page 72



This illustration shows the basic components of the Amiga screen.

continued from page 71

memory at any one time. These can instruct it do such things as draw pictures or operate a spreadsheet.

The second type of information is known as 'data'. This is also held in RAM, but instead of providing instructions for the CPU, it provides information on which the programs may operate. For instance, a program which adds two numbers together needs some data before it can be of any use. These two numbers are the program's input data. The result of the addition is the output data. Another example is given by the *Deluxe Paint* package. This is a program. Any key presses or mouse movements you make are input data for the program; the picture that is gradually drawn is the output data. Of course, this picture may be saved on to a disk at any time, and loaded back at a future date. In such a case, the picture has now become input data for the program. As you can see, the distinction between input and output data can become somewhat blurred.

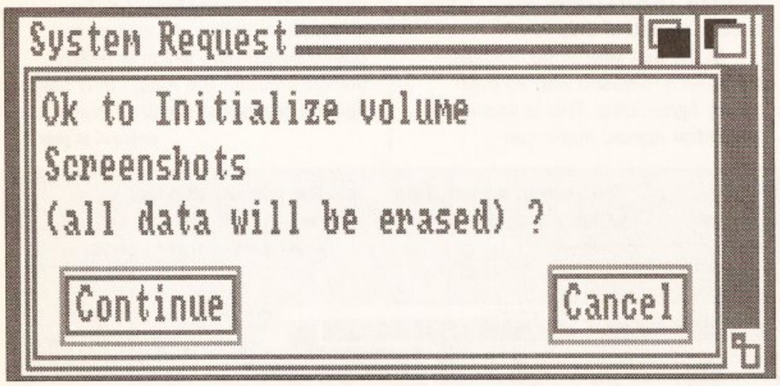
WIMP

In days of yore, people used to control computers exclusively by keyboards. Because of the relatively new WIMP (windows, icons, menus, pointer) system, many tasks can be greatly speeded up and performed in a more intuitive manner (hence the name of the part of the Amiga's operating system that deals with this: Intuition).

All disks, programs and related collections of data are displayed on the screen as small pictures, known as icons. To prevent things getting too cluttered, the screen is divided into small sections called windows, in which the icons relevant to that window are displayed. Each window may be open or closed (in which case it reverts to either a disk or a drawer icon), moved around relative to the screen, moved in front of or behind other windows on the screen, and resized to display more or less information. All of this may be done by means of gadgets – small graphical symbols around each window's borders that represent these functions. Windows may be nested hierarchically inside each other by means of drawer icons. Whenever a drawer icon is opened, a new window is drawn with its own icons within it.

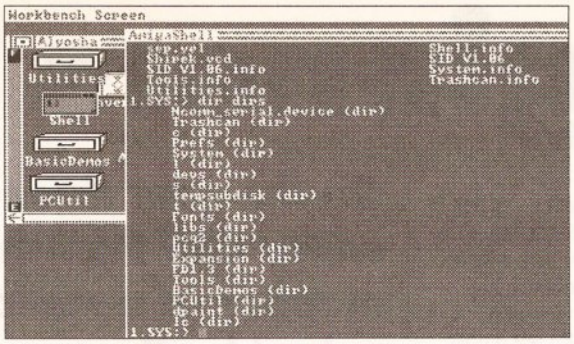
Icons are accessed with the screen pointer, which is moved across the screen by moving the mouse across the desk. Once the pointer is above an icon, that icon can be accessed by pressing the left mouse button twice in quick succession (a process termed 'double-clicking'). The effects of this will vary depending on the icon in question: in the case of a disk or drawer icon, a window will be opened; in the case of a program (or 'tool'), the program will be loaded from disk into RAM and run (in other words, the Amiga will start to follow the instructions contained in the program); clicking on a data icon (or 'project') will result in the data's corresponding program or tool being loaded from disk along with the data on which it will begin to operate. The pointer is also used to control a window's gadgets, but in this case the left mouse button need only be pressed once.

A special type of icon that you should be aware of is the 'trashcan' icon. Other icons may be moved inside here by placing the pointer above them, pressing and keeping pressed the left-hand mouse button, and moving the pointer and icon until they are above the trashcan. Releasing the mouse button results in the icon being dumped in the trashcan. The contents of the trashcan can be revealed by clicking on it in the same way as you would click on a drawer icon. The difference is that the trashcan may be emptied, in which case all of its contents are gone for good. Handle with care.



A system requester, giving a chance to reconsider.

Menus are another innovation of the WIMP system. Menus are a list of options displayed in a text box, selected by means of the pointer. In this way, more complex operations can be performed with the mouse and without recourse to the keyboard. When first switched on and with Workbench loaded in RAM (Workbench is the part of the Amiga's operating system which is not held permanently in ROM), a basic set of menus are available which enable you to do such useful things as copy disks and so forth. Most programs have their own custom set of menus, relating to the particular things that the program is used for.



The Shell provides a command-line interface to the Amiga, similar to that used on IBM PC-compatibles.

Menus are displayed at the top of the screen. Pressing the right-hand mouse button (and keeping it pressed) reveals the title of each available menu in the white bar at the top. Moving the pointer up to one of these titles (with the mouse button still pressed) will cause the Amiga to display the list of options in a box beneath the title. As the pointer is moved down this box, each of the options will be highlighted in turn. Releasing the right-hand mouse button with one of the options highlighted will result in that option being executed.

Although not mentioned in the WIMP acronym, another aspect of the system is the 'requester'. A requester is a box that appears on the screen during an operation – usually a dangerous one such as erasing a disk – displaying a small amount of text and asking the user for what is normally a yes or no reply. In the case of erasing a disk, the text will say 'Ok to initialise volume [name of disk] (all data will be erased)?'. Two gadgets are displayed, one with 'Continue' written in it, the other displaying 'Cancel'. The option you want is selected by moving the pointer over the relevant box and pressing once on the left-hand mouse button.

MULTI-TASKING

One of the Amiga's special features that you've no doubt heard about is multi-tasking. The Amiga is unique amongst home computers in having this feature; in fact it's not until you begin to look at computers very much more expensive than the Amiga that you will normally find such a thing.

But what is it? Basically, multi-tasking is the ability to run more than one program at the same time. This may not seem like a big deal: after all, there is only one of you controlling the thing, and you can't control more than one program at a time. There are advantages to multi-tasking, though.

At its simplest, multi-tasking allows several programs to be running in memory, waiting for you, the user, to use them. You can be working on one of these programs, a word processor for instance, and suddenly realise that you need to do some mathematics so that you can put the answers to some calculations in your document. Ordinarily, you would have to quit out of the word processor, load up the calculator program (OK, I'm assuming you don't have a pocket calculator, but you get the idea), do your sums and write down the answers, then quit out of the calculator and load your word processor again, load in your document, find where you were in it and type in the answers from your piece of paper. Quite a hassle. With the Amiga, the calculator could have been waiting in the background all along, eager to help you out. A couple of mouse clicks brings it into action, and you can get your results there and then. Again, a couple of mouse clicks brings back the word processor, exactly where you left it. With more sophisticated software, you will often find that the data can be directly transferred from one program to another, saving you even more work.

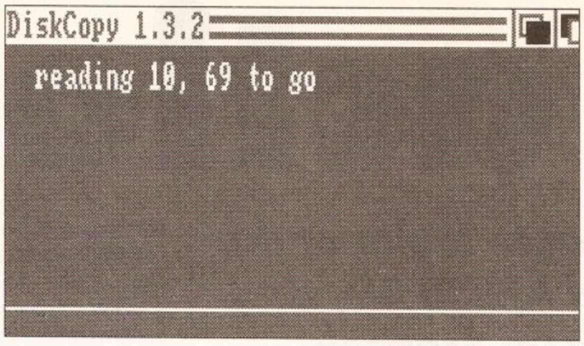
Another advantage of multi-tasking is in running programs which require little or no user input. For instance, you could set a landscape generator going, and meanwhile get on with adding up your family accounts or whatever.

Theoretically, there is no limit to the number of programs you can have running at once. In practice, the number is limited by your available memory: each program requires its share. Also, the more programs that are running, the slower the machine becomes overall. This is because of the way multi-tasking works.

The central processor of a machine like the Amiga can only do one thing at a time. A part of the Amiga's operating system known as Exec (for Executive) decides what the processor will do next. It looks at all of the programs running, and gives each of them in turn a little slice of the processor's time. This swapping from one program to another

happens so fast that all of the programs seems to be running at once. It's all very clever, especially when you consider that Exec itself is just one amongst the many programs running in this way.

To be fair, there are a couple of disadvantages to multi-tasking. The first is that it is often unnecessary. It *can* be useful, but ore often than not you will want to use your computer for one job at a time. But because multi-tasking is such a complex business, it means that the Amiga's operating system is much bigger and complex than it might otherwise be. And this means that it is more likely to fall over occasionally, which leads us on to the second disadvantage: crashing. On mini and mainframe computers, which as well as being multi-tasking also support several users, each program is well protected from all of the others running at the same time. That way, if one program crashes, the rest can go on unharmed. With the Amiga, though, this is not the case. It is possible for a rogue program to effect any others that may be present. In general, if one program crashes on the Amiga, they all crash and the machine has to be re-booted. If you've been entering your accounts for the last hour and a half when your Mandelbrot program decides to crash, all of your typing will be lost. This is one good argument for saving your work to disk at regular intervals.



The display you can expect when copying (duplicating) a disk. A disk is divided up into 80 cylinders, most of which

COPYING DISKS

The first thing that you should do after unpacking your new Amiga is to make copies of your Workbench and Extras disks. This advice also applies to any other disks that you get – although most games and some serious software won't allow you to do this in the interests of preventing piracy.

Copying disks is a good idea because disks have a tendency to get corrupted and lose whatever is stored on them from time to time. Always use the backup copies that you have made, and store the originals in a safe place against the eventuality that your backups fail.

Copying disks on the Amiga is easy, although if you only have one disk drive it can take a little bit of time. In the following description, I'll assume that you only have one floppy disk drive.

First, boot the machine up as normal (this simply means 'switch it on and put in the Workbench disk when you are told to do so'). Then insert the disk that you want to copy. Move the pointer over the disk's icon, and click on it once with the left-hand mouse button. The icon should change colour. Now, using the right-hand mouse button, go to the Workbench menu at the top of the screen and select the Duplicate option. A requester will appear asking you to replace the Workbench disk. Do this. There is no need to click on the 'Retry' box (although you can if you really want): the Amiga will realise when you have inserted the correct disk.

You will then be asked to insert the disk that you want to copy. Having done this, you will be asked to insert the 'SOURCE' disk. Actually, this is exactly the same as the disk that you want to copy. If you are sure you have inserted the right one, click on the Continue gadget in the requester with the left-hand mouse button. The Amiga will start reading the information from the disk, keeping you informed as to how much of the reading it has done and how far it still has to go.

After a time, you will be asked to insert the 'TO' disk. Insert a spare disk, but be sure that there is nothing on it which you want to keep, since all of its original contents will be lost. Once this disk is inserted, click on the Continue gadget. The Amiga will start writing the new information to the disk.

Once this is done, you will be asked to insert the SOURCE disk again. This process of swapping disks will continue until the whole of the original disk has been read and susbequently written to the new disk. After this, the new disk will be named as 'copy of [name of original]'.

It is usually a good idea to rename the disk as something more sensible. To do this, select the disk by clicking once on its icon with the left-hand mouse button, then go to the Workbench menu and select the Rename option. Delete the text of the old name in the box provided, and then type in the name by which you want to refer to the disk. When you are done, press the [Return] key and the whole process is finished.

THE SHELL

Although most things that would ordinarily require a keyboard can be done on the Amiga using the mouse and WIMP system, there are nevertheless hidden depths which can only be accessed by means of good old typing. These functions are performed by using the Shell, which has an icon that looks like a miniature window.

Older versions of Workbench (version 1.2 and below) don't have a Shell. Instead, they have a CLI (standing for Command Line Interface), which works in pretty much the same way but lacks some of the Shell's more advanced features and is therefore a bit more awkward to use. The CLI's icon looks just like that of the Shell, and may be found in the System drawer of the Workbench disk. If it is not visible, the Preferences icon must be clicked on (inside the Preferences drawer). Once loaded, Preferences will display a screen-full of options, one of which will refer to the CLI. Click on this, and next time you look in the System drawer the CLI will be there, ready and waiting.

Clicking twice on the Shell or CLI icon will open a text window on the screen. It is generally a good idea to enlarge this window so that it takes up all of the screen, since a lot of text can be generated when you are working here.

A full description of what can be done in the Shell is really beyond the scope of this section, but we'll give you a quick taster. One of the most used commands is the 'directory' command, which gives a list of files (programs and collections of data) on a disk. When the Shell opens, you are presented with a 'prompt' inside the window. At this prompt, type the word 'dir' and press the [Return] key.

The disk will whirr, and you will be given a list of all of the files on the disk. You may be surprised to find that there are a lot more files than there are icons when viewed from an ordinary window. For a file to be shown as an icon, it must have a corresponding file with the same name but followed by the characters '.info'. This second file contains information about the icon, such as what it looks like, what kind of file it represents, and where on the screen it should be displayed.

Some filenames have the characters '(dir)' after them. This is not part of the name, but an explanation that the file in question is not a file at all but a directory. A directory is exactly the same as a Workbench drawer. Things are held within it. For example, on the Workbench disk there is a directory called 'c' (standing for 'commands'). This is not visible except from the Shell, because there is no corresponding 'c.info' file and therefore no icon. To find out what is in this directory, type 'dir c' and press [Return]. What is displayed is a list of files. In this case, each of them is a program which you can run by typing its name in at the Shell prompt. If you look closely, you will find a command called 'dir', which is the one you have been using to look at the Workbench disk's contents. For more information about the Shell, check out Mark Smiddy's monthly AmigaDOS column. AS

IN NEXT MONTH'S ISSUE...

Every month in *Amiga Shopper* we print 16 pages of Amiga Answers – answers for everyone from beginners to experts. If you have a question, fill in the form on page 50 and pop it in the post to us.

Amongst the questions we intend to answer in next month's issue are the following:

- **"How can I get fonts bigger than 50pt for use with *PageSetter*?"**
- **"How can I get *Protext* to print out a mail merge without stopping whenever the printer buffer becomes full?"**
- **"Can I use a flicker fixer alongside a 24-bit colour board and a genlock on my A1500?"**
- **"Where are the DOS library subroutines? And why when I load a program for dissassembling in *Monam* does it end up in lots of bits and pieces around memory instead of as a nice simple block with a start and end address?"**
- **"Why won't my version of *Professional Page* work unless I boot up with it? Shouldn't I be able to multi-task it along with other programs?"**
- **"Just what is the advantage of Kickstart 1.3 over 1.2? How easy is it to upgrade, and would I better off waiting for version 2.0?"**
- **"How can I get my 'hello world' program to compile into an executable file under *NorthC*. It compiles OK, but when the assembler gets hold of it an undefined symbol error is given."**

AMOS action

This month Phil South looks at the release version of AMOS 3D, and checks out a tip from François Lionet, the creator of AMOS



"If you use AMOS, you'll find lots of hints, tips and ideas on these pages every month."
Phil South

It's been years in the making, but AMOS 3D is now finally available for you to buy. And you should, too, because it's a super piece of software, as you'll see. This month we also have a very useful little tip from François Lionet, the man behind AMOS. Plus demos, tips and ideas; read on...

AMOS 3D

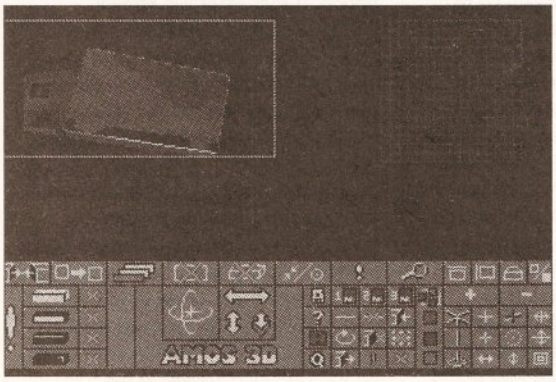
I've waited a long time for AMOS 3D, and as the days stretched out into months it began to seem that perhaps it was impossible, that you couldn't create 3D objects and move them around in real time using a Basic interpreter. But now it's out, and we can all breathe a sigh of relief. I've tried it, and it works!

To install AMOS 3D, all you have to do is run the install program supplied on the disk. This is an AMOS program which first of all allows you to install AMOS 1.3 (which is needed if you intend to run either AMOS Compiler or AMOS 3D) on a floppy or hard disk, if you don't already have that version of the program. AMOS 3D is an extension to AMOS, not a program that you run separately, so it's actually installed into your version of AMOS. To let you know that 3D is installed, the words 'Voodoo 3D extension I 1.00' are included with the other extensions on your AMOS startup screen when you run the program.

CHANT AFTER ME: OM

You are now ready to run the object modeller program, OM. This is launched either by typing 'OM' if you're a CLI-head, or simply clicking on the icon if you are running from Workbench. OM prefers to run alone, so free up memory by quitting any other programs you may have running before you start.

OM is a stand-alone program which allows you to create objects for use within AMOS. The program features a lot of tools for stretching, squashing and forming primitives like squares, circles, cubes and pyramids. You copy the primitives to work areas on the screen called 'shelves' (I don't know why, so don't ask), where you then work on them with the mouse, selecting a point, line or face and deforming it by clicking on the control handle, holding the button down and moving the mouse. It couldn't be simpler.



OM in action. This is the stand-alone 3D object creator program.

Once you have exotically reshaped primitives you can 'glue' them together to make other, more complex objects. This is done by simply selecting the faces that need to be glued together on the two objects and clicking on the correct control; the program then automatically joins the two objects.

Next you apply surface detail – patterns in four colours which you can map to the selected face of the object. This is done by drawing lines on a grid, which are then filled before they hit the face of the object. The neat thing about these surface detail grids is that they can be copied to and from objects at will, so you can copy a face back on to the grid if you forgot how to draw it, even if the object is one you created ages ago.

USING OBJECTS

Once the AMOS 3D extension has been installed into AMOS, you can load and move 3D objects in your AMOS programs using a series of new commands. To use these commands, you have to come to terms with the idea of space: 3D space. The world now has a trio of axes, called x, y and z; x and y are the ones we are used to on the computer screen, and translating objects around that screen merely involves adding numbers to their (x,y) coordinates – like the numbers following a 'move sprite' command, which alter its position. But now you have an extra dimension – that of depth – known as the z dimension.

AMOS 3D's new set of commands are called 'Td' commands, and these preface any 3D commands you put in your programs. For instance, I knocked up this example in about 10 seconds flat, using one of the examples on the disk as a basis.

```
'*************************
'* Snoutwedge Demo v1.1 *
'*************************
'
Td Dir "om:om/examples"
'
Hide
Double Buffer
Autoback 0
Td Load "snoutwedge"
Td Object 1,"snoutwedge",     ↵
0,0,5000,0,5000,-4000
Palette ,,,,,,,,,$FFF,$F,$777
Repeat
Rem Move your objects here
Td Angle 1,A,0,A
```

AMOS HINTS AND TIPS

• There are many DOS-type calls which can be performed from within AMOS (see the seperate boxout on the next page for details of accessing the time and date). One such call is to allow file copying from within a program. Many thanks to Alasdair Foster of Dundee for sending in a listing, although I couldn't make it work properly when I tried it. However, here's a similar routine from AMOS Programs 16 (AMOS PD disk 233):

```
'   AMOS COPY
'
'   syntax: AMOSCOPY["Source","Destination"]
'
Screen Open 0,640,30,2,Hires
Flash Off
Colour 1,$FF
Line Input "Source File:";A$
Line Input "Destination File:";B$
AMOSCOPY[A$,B$]
'
Procedure AMOSCOPY[A$,B$]
If Exist(A$) Then Print "Copying ";A$;" To  ↵
";B$; : Open In 1,A$ : L=Lof(1) : Close 1 : ↵
Erase 5 : Reserve As Work 5,L : Bload       ↵
A$,Start(5) : Bsave B$,Start(5) To Start    ↵
(5)+L : Erase 5 : Print "...Finished" :     ↵
Else Print "File Not Found ";A$
End Proc
```

If you have any hints and tips (preferably accompanied by mini listings) that you want to share with the rest of us, send them to me: Phil South, AMOS Column, *Amiga Shopper*, 30 Monmouth Street, Bath BA1 2BW. Or you can e-mail me on CIX (snouty@cix.compulink.co.uk), Micronet (219997854), Telecom Gold (74:MIK2077) or The Direct Connection (uad1135@dircon.uucp).

```
A=A+1000
Cls 0
Td Redraw
Rem You can draw on top of ↵
the 3D objects here
Screen Swap
Rem Sync with screen display
Wait Vbl
Until False
```

Double buffering is definitely required to smooth the transition between one redraw and the next; in fact, this is the way such things are done in professional 3D programs written in assembler.

As well as rotating the objects and moving them in and out of the screen, you can animate the surface detail, animate the shape, perform collision detection with other 3D shapes and generally do all the things you'd associate with a top-flight 3D game or PD demo disk by a really talented vector graphics crew.

It all sounds like a bit of a dream really, doesn't it? But it's all true. The 'Snoutwedge demo' above works like a dream, and although it's not a silky smooth as I would like, the effect is undeniably solid and professional-looking.

SUMMING UP

AMOS 3D completes the AMOS system with a big flourish. Now it's possible to create not only games, but a whole variety of new and hi-tech programs. Virtual reality? Well no, not really, but AMOS 3D is certainly a very good 3D program, and as a modeller I much prefer it to 3D Construction Kit. I can't really fault it, and although I could say that I'd like to see it work a little faster, I know this isn't really possible. Compiling obviously smooths things out, but not all that much.

My only wish is for a utility to transfer objects from one disk to another, as an object is made of a number of obscurely named files, and you have to load them into OM and save them to another disk in order to be sure of getting all the files. Otherwise I'd call AMOS 3D the perfect complement to the AMOS system, and one that I know I'll be using a lot in the weeks to come.

DEMO CORNER

Europress keeps me well stocked with AMOS demos, and some of the very best these days come from that wacky French demo crew Syntex. Their current opus is called Dark Ages, and is a two-disk megademo, containing all manner of plasma and 3D effects I didn't think were possible in AMOS on its own. But then, Syntex are certainly no ordinary bunch of AMOS hackers!

My particular favourite part of the demo is the 3D bit, where the program asks you to put on red/blue specs, and then proceeds to show a 3D object which floats about an inch in front of the screen. Very clever stuff indeed.



Part of the *Dark Ages* demo from Syntex – and it's all done in AMOS!

The AMOS PD Library continues to do good things for AMOS, and for PD in general, and this month's crop of new AMOS PD is no exception. Some of the stuff I received was from Deja Vu Software, and was very high quality indeed. FracGen II, for example, is a collection very smart fractal programs, some of which I've never seen before. All of them are written in AMOS, and all of them are very neatly done. The whole thing works on a menu system, so it all looks fabulous. T-Tec Draw is a technical drawing program which gets a higher resolution from your printer by using a 4x4 screen super bitmap. CAT is the Creative Adventure Toolkit, a program that enables you to write text adventures with graphics and sound which you can then save as stand-alone versions for resale.

Well, that's all we have time for this month I'm afraid. Join me again next time, when I'll be looking at AMAL again, and checking out the new release of AMOS – version 1.31. See you then! AS

SHOPPING LIST

AMOS can be obtained from your local stockist or from:

Europress Software
Europa House, Adlington Park,
Macclesfield SK10 4NP
☎ 0625 859333

All AMOS PD software can be obtained from:

AMOS PD Library
25 Park Road,
Wigan WN6 7AA.
☎ 0942 495261

TIME AND DATE TUTORIAL

François Lionet, the creator of AMOS, is always being asked if DOS functions can be accessed from the program. Well, of course they can, but you need to know what knobs to twiddle, as it were. One of the most popular questions is how to access the time and date from the internal clock in the Amiga using AMOS, so here is François' solution. Use it by merging the procedure with your regular AMOS programs, and you will be able to run a clock from an AMOS program, or even do weird stuff like plotting the positions of stars from the actual date and time!

```
'---------------------------------
' How to get TIME and DATE in AMOS
'---------------------------------
'
_DATE$ : Print Param$
_TIME$ : Print Param$
'
Procedure _DATE$
'
' Call DOS DateStamp function
T$=Space$(12)
Dreg(1)=Varptr(T$)
RIEN=Doscall(-192)
NJ=Leek(Varptr(T$))
'
' Find this year's first day
A=1978 : JOUR=7
Do
BIS=0 : If(A and 3)=0 : BIS=1 : End If
Exit If NJ-365-BIS<0
Add JOUR,1+BIS : If JOUR>7 : Add JOUR,-7 : ↵
End If
Add NJ,-365-BIS
Inc A
Loop
'
' Find month
M=1
Do
Read N
Exit If NJ-N<0
Add NJ,-N : Inc M
Loop
Inc NJ
'
' String them together
J$=Mid$(Str$(NJ),2) : If Len(J$)<2 : ↵
J$="0"+J$ : End If
M$=Mid$(Str$(M),2) : If Len(M$)<2 : ↵
M$="0"+M$ : End If
A$=Mid$(Str$(A),2)
DATE$=J$+"-"+M$+"-"+A$
'
' Length of each month
Data 31,28+BIS,31,30,31,30,31,31,30,31,30,31
'
End Proc[DATE$]
Procedure _TIME$
'
' Call DOS function
T$=Space$(12)
Dreg(1)=Varptr(T$)
RIEN=Doscall(-192)
MN=Leek(Varptr(T$)+4)
SEC=Leek(Varptr(T$)+8)
'
' Minutes calculation
H=MN/60 : H$=Mid$(Str$(H),2) : If Len(H$)<2 ↵
: H$="0"+H$ : End If
M=MN mod 60 : M$=Mid$(Str$(M),2) : If ↵
Len(M$)<2 : M$="0"+M$ : End If
'
' Seconds calculation
S=SEC/50 : S$=Mid$(Str$(S),2) : If Len(S$)<2
: S$="0"+S$ : End If
'
' Final string
TIME$=H$+":"+M$+":"+S$
'
End Proc[TIME$]
```

TELETEXT

A world of information at your fingertips



Now you can keep it informed with the latest weather, financial news, sports results, current affairs and much more from Ceefax or Oracle. But unlike a Teletext TV all this valuable information isn't trapped behind glass. Now you can...

Save to disk. Pages may be saved in Compact (over 800 pages per disk) or IFF format.

Print. You can print as just text (for a fast result) or as a screendump.

Review. Instant access to the last 16 pages which have been received.

Speak. Thanks to the Amiga's speech capability, it will even read the news to you.

Multiple display. It can display and update two pages on screen simultaneously!

FastText. True FastText - get pages in advance and reduces the waiting time.

Tuning. Just connect an aerial - it tunes itself in! Although the prime function is to receive Teletext, it also will convert a 1081, 1084 or 8833 monitor to a colour TV.

Programmable. The system can be programmed to get a series of pages and then save to print them. Your own programs can access the data on Teletext.

Only a **Microtext** adaptor can provide all these facilities. It's easy to use and connects to the parallel port, a printer can be reconnected to the adaptor. Everything is supplied, all you need is your Amiga and a normal TV aerial.

At just **£129.50** + VAT (= £152.16) for an advanced Teletext TV it's excellent value for money. VHF/UHF version for use outside the UK £169.50. Make sure you're always up to date, get yours now from Microtext.

VISA **MICROTEXT** Access

Dept AS 7 Birdlip Close, Horndean, Hants PO8 9PW
Telephone: 075 595694 Fax: 0705 593988

Exciting New Products From Checkmate!



CanDo 1.5 Software Authoring Tool

This incredible package will build audio-visual systems for Multi-Media and Vertical Market applications, plus all final programs can be be made free running on systems without CanDo.
With powerful Database functions, Floating point support and the Most powerful Animation control system ever built into any Amiga software.

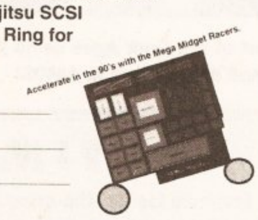
CanDo 1.5 now Only £99.00 CanDo Test Drive £10.00

Checkmate A1500
The ultimate upgrade for Amiga A500's
New Low Price
ONLY £169.00 inc vat

"A first class bit of kit."
Amiga Shopper May 1991



Remember Checkmate for your Hard drive systems. ICD, GVP and Nexus controller cards. Checkmate sell Quantum and Fujitsu SCSI Drives, Ring for prices.



H A M - E

24 Bit Graphics Display Hardware
For The Rest Of Us.
Two Modes Available include:-
256 Colour with 16.8 Million Palette.
262,000 Colours on screen HAME Mode.
HiRes Version 760x560 Pixels £399.00
Standard Version 380x560 Pixels £299.00
Ring for full specification.
Works with DPaintIII, CanDo, AMOS, and many other equally powerful programs. Mix HAME Pictures and Workbench on one screen.

CHECKMATE DIGITAL LIMITED

Tel +44 (0)71-923 0658, Fax +44 (0)71-254 1655
BBS +44 (0)71-923 2608
Checkmate Digital Ltd, 80 Mildmay Park, London, N1 4PR

Amiga Hard Disks and Ram

Fujitsu 3.5" SCSI Hard Disks

43Mb, 25ms, 1" high £199
90Mb, 19ms £349
135Mb, 19ms £469
180Mb, 19ms £520

All Fujitsu drives fully support synchronous SCSI transfer (with Amiga 3000 and some Amiga 2000 controllers)

Tapestreamers now available!

150Mb SCSI tapestreamers now available.
Prices start at £399. Please ring for details.

Seagate, WD, Conner, Maxtor

Far too many drives to list here, please ring for details and prices. MFM, RLL, ESDI, SCSI and AT drives available.

Amiga SCSI controllers

Please ring for details and prices of IVS, XETEC, GVP, SUPRA, ICD MICROBOTICS, DATAFLYER and COMMODORE controller cards.

RAM Chips

256x4 80ns DRAM (for A590, A2091, A540, etc.) ...£42 per Mb
1 Mbx1 80ns DRAM (for A2058, 8-Up, etc) ....£44 per Mb
1 Mbx9 80ns SIMMS (for GVP Series II, etc) ....£42 each
4 Mbx9 80/70ns SIMMS ....£Call

Plus 3.5" SCSI Hard disks (Quantum)

52Mb, 17ms, 1" high £249
85Mb, 17ms, 1" high £399
105Mb, 17ms, 1" high £439
120Mb, 15ms £499
170Mb, 15ms £689
210Mb, 15ms £749

All Plus hard disks have a 64kb inbuilt cache which gives an 11ms read access time.
Quantum is a subsidiary of Plus Development

FREE PUBLIC DOMAIN

Buy any hard drive over 100Mb from us, and we will put on as much free Public Domain software for the Amiga as you want! Just say how much you want, you can list specific Fish disks (1 to 410) in your order if you wish.

Almathera Systems Ltd.

Tel (081) 683 6418 Fax (081) 689 8927
Challenge House, 616 Mitcham Rd, Croydon, CR9 3AU.

All prices **include** VAT and delivery.

Data cables and 5.25" mounting frames are extra. Free PD can only be provided for controllers that support Commodore's Rigid Disk Block standard (CBM A2091 & A590, GVP Series II, Microbotics Hardframe, ICD etc). Please check your controller manual.

All prices are correct at time of going to press. E&OE. All trademarks respected.

Data in, data out

This last article in Sam Littlewood's C programming series adds file handling to the structured drawing program which he has been writing

> "In the interests of those of you who occasionally re-boot or even turn off their Amigas, this month I'm looking at file handling."
> **Sam Littlewood**

As our *ADraw* program stands, there is no way of saving a project from one session and reloading it in a future session for further editing. If *ADraw* is to become a useful program, then we need to rectify that omission.

There are two distinct routes which can be taken when you are writing file handling routines, one of which has a further division. The main decision is whether to save the data as ASCII text or as raw binary information. If raw binary is to be chosen, then the further decision is whether to use a completely custom format unique to your program, or a format which is based around the IFF standard.

Some examples are in order to explain the pros and cons of these two methods. All the examples will be based around saving an example project to disk; this project is assumed to contain:

- A box at (100,100) that is 150 units wide and 40 units high.
- A circle at (50,80) with a radius of 30 units.
- A line starting at (100,100), going to (150,150) and finishing at (200,100).

The above is an English description of the data structures that would have been allocated in memory by *ADraw*.

DATA RECOGNITION

For *ADraw* to actually be successful at saving and loading projects it must be able to convert its internal data structures into a format which can be saved out as a disk file. Having done that it must then be able to recognise the various sections of the file and recreate internal data structures that are equivalent to those originally used to generate the file.

In some programs it would be appropriate to create a disk file which was a byte-for-byte duplicate of the in-memory structures; Listing 1 shows an example of this type of approach. In this listing the program first asks AmigaDOS to create a new empty file of a given name (replacing any existing file of the same name). It then uses Write() to copy bytes to that file.

The starting point for the copy is the address of SaveData, a structure that has been filled in with various values. This address is cast to be (void *) – a generic pointer of no particular type.

The number of bytes to write out is determined by using the 'sizeof()' operator. The compiler replaces 'sizeof(*mem)' with the number of bytes occupied by the sort of thing pointed at by mem – a MemoryData structure.

Having duplicated the referenced chunk of memory in a disk file, the process is reversed in LoadFromFile(). This time around, instead of asking AmigaDOS for a new file – MODE_NEWFILE – an existing file is accessed with the MODE_OLDFILE command. If the file did not exist, Open() will return zero, and LoadFromFile() will abort its task at that point.

The AmigaDOS function 'Read()' takes exactly the same arguments as Write(): a handle to an open file, a pointer to a block of memory, and a size in bytes. Not surprisingly, Read() fills in the memory indicated from the contents of the file. Both Read() and Write() return the same value: the number of bytes processed.

In each case, if the number of bytes processed was not the same as the size requested, then there was a problem. Write() is only likely to return a value less than requested when the destination disk is full – a possible but fairly rare event. A more common situation, especially when debugging, is there not being enough data in the file to satisfy the request to Read(). The size returned in this case will be that which was available from the file.

This example will successfully save and load some test data, but it does have its problems. Before

continued on page 78

POWERWINDOWS

This series has, on purpose, not used any tools other than the Amiga and a C compiler. If you are prepared to shell out a bit more, though, there are some extra tools that can – with care – help development along.

One such tools is *PowerWindows*, currently standing at version 2.5. It is touted as the final and only word in creating your user interfaces – menus, gadgets and so on. Well, it is certainly the first word, but there are some large tracts of the story it really just skips past.

The general idea behind the program is that you take advantage of an easy-to-use Amiga-style interface – windows, mouse, gadgets, requesters and menus – to drag, move, stretch and label all the bits for your own easy-to-use Amiga-style interface (windows... etc). Having done this you push a button and out comes ready-to-compile source code for the front-end of your application.

A few hops, skips and idyllic jumps and there stands a work of art, complete and easy to use.

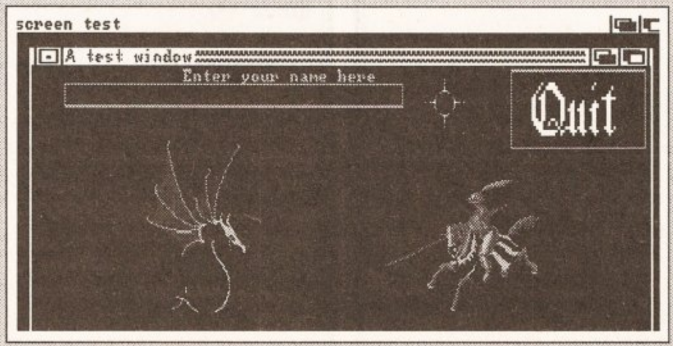
Hmm, I wish.

***PowerWindows* certainly does let you create all the elements of the Intuition interface and edit all the various attributes – work that would normally entail editing large numbers of structures. It does also generate correct source code (in one of several languages) for all of these things. Personally I have found this its most useful aspect – I can get it to create roughly the right sort of thing, and then take the generated source code and clean it up to my own requirements.**

One particularly good feature is the ability to load IFF brushes in and use them as the imagery for gadgets. It saves out the whole shooting match, including all the correct definitions and arrays for the picture data.

One of the problems I have with *PowerWindows* is its own user interface. It does not lend itself to fast or intuitive work, and it can take a long time to get a reasonably complicated set of gadgets evenly spaced and lined up – longer than it would have taken to save out the source and tweak the structures directly. So far this has been the way things have gone for me: I have used it to prototype the way a front-end might look, used it to generate the first draft of all the gadget structures, and then taken it from there by hand.

Conclusion? Well, *PowerWindows* is no silver bullet, but it does have its uses for getting ideas together.



***PowerWindows* is useful for creating the prototype of a front-end, but needs some improvements before it will be truly 'the last word'.**

LISTING 1 • LISTING 1

```
#include <exec/types.h>
#include <libraries/dos.h>
#define F_SIZE  4
#define N_SIZE  128
/* An example template for some data to be saved and loaded
*/
struct MemoryData {
        int     i;
        int     j;
        int     k;
        int     l;
        float   f[F_SIZE];
        char    n[N_SIZE];
};
/* An instance of that above structure, initialised to some ↵
non-zero values
*/
struct MemoryData SaveData = { 1,2,3,4, { 1.0, 2.0, 3.0, 4.0 }, ↵
"A name" };
/* Another instance of the same structure, but un-initialised
*/
struct MemoryData LoadData;
/* SaveToFile
 *
 * Write a data structure to the given filename
 *
 * Return 0 if success, 1 if failure
 */
int SaveToFile(char *name, struct MemoryData *mem)
{
BPTR    filehandle;
int     length;
/* Open a new file (if file exists it will be truncated to zero ↵
length)
*/
filehandle = Open(name,MODE_NEWFILE);
if(filehandle == -1)
        return 1;
/* Copy data from memory to file
*/
length = Write(filehandle, (void *)mem, sizeof(*mem));
/* Close the file
*/
Close(filehandle);
if(length == sizeof(*mem))
        return 0;
else
        return 1;
}
/* LoadFromFile
*
* Fill in a data structure from the contents of a named file
*
* Return 0 if success, 1 if failure
*/
int LoadFromFile(char *name, struct MemoryData *mem)
{
        BPTR    filehandle;
        int     length;
        /* Try to open an existing file
        */
        filehandle = Open(name,MODE_OLDFILE);
        if(filehandle == 0)
                return 1;
        /* Copy data from file to memory
        */
length = Read(filehandle, (void *)mem, sizeof(*mem));
        /* Close the file
        */
        Close(filehandle);
        if(length == sizeof(*mem))
                return 0;
        else
                return 1;
}
/* A sime main program to chain e abve examles together - Save ↵
the initialised
* data to a file, and then loadit back into another structure
*/
int main(int argc, char *argv)
{
        if(SaveToFile("test.data",&SaveData)) {
                printf("Could not save file\n");
                exit(10);
        }
        if(LoadFromFile("test.data",&LoadData)) {
                printf("Could not load file\n");
                exit(10);
        }
        printf("%s\n",LoadData.n);
}
```

continued from page 77

looking at these problems, though, let's take a quick look at 'levels' of file handling is in order.

TRACKING RESOURCES

Listing 1 goes straight to AmigaDOS. It is the lowest 'OS legal' way of getting at files. The only help from the C compiler is the instructions to put arguments in the appropriate 68000 registers for AmigaDOS.

This is fast and simple, and there is no 'hidden' code added in to our program; however, AmigaDOS does not perform any resource tracking. If a program opens a file but does not close it, the file will stay open until the machine is re-booted. (This same lack of resource tracking also holds true for memory allocation: unfreed memory that was allocated directly from AmigaDOS will, if forgotten, stay reserved until a reset is performed.)

In the interests of portability and controlled side effects, all C compilers, whatever the machine that they run on, have some 'helping functions' as part of their libraries. These functions are not another route to the disk files, rather they are a layer (or layers). The bottom side of the layers use the AmigaDOS functions – Open(), Read(), Write(), Close() and so on. The top side of the layers present functions that operate in a somewhat similar manner to the Amiga's but are compatible with similarly-named functions on other machines and operating systems. In addition, the code that makes up the layers adds more friendly features like resource tracking.

The first layer up from AmigaDOS is a hangover from the origins of C. This comprises the functions open(), read(), write(), close() and so on. (Note that these function names are all lower-case, unlike the AmigaDOS calls.) These similar functions are replicas of the Unix system calls upon which the C library is based. They operate in an almost identical fashion to the corresponding AmigaDOS functions, but add resource tracking – if a program that has used these functions stops half-way through, any open files will be closed automatically (See Listing 2).

Using these functions is much the same as as using raw AmigaDOS. The only big advantage (in a purely Amiga world) is the resource tracking.

Taking the unorthodox view that there are other sorts of computers in existence besides the Amiga, another potential advantage of using these functions is that almost any commercial C compiler on any machine will provide these functions in its library, and they will work in exactly the same way – allowing some or all of a program to be simply recompiled without editing if you wish it to run on another computer.

A disadvantage of using these functions – especially if your program is civilised enough to keep track of what files it has open, and close them when it exits – is that a layer of code has been bolted on by the compiler to convert these standard calls into the sort of things expected

LISTING 2 • LISTING 2

```
#include <fcntl.h>
/* File loading using C library calls
*/
int LoadFromFile(char *name, struct MemoryData *mem)
{
int filehandle;    /** File handle is no longer a BPTR **/
int length;
/* Try to open an existing file
*/
filehandle = open(name,O_RDONLY); /** Different argument ↵
used to signify mode **/
if(filehandle == -1)  /** Different return value on ↵
error **/
return 1;
/* Copy data from file to memory
*/
length = read(filehandle, (void *)mem, sizeof(*mem));
if(length != sizeof(*mem)) {
/** Program can be safely aborted without explicitly ↵
closing files
**/
exit(10);
}
/* Close the file
*/
close(filehandle);
}
```

by AmigaDOS. This code is added in during the link phase, and adds fuel to the criticism that 'C programs are always big'.

FREE FUNCTIONS

This is not the end of it. There is a further layer that can be called upon to increase the size of programs. Again, this is a layer that is common to all C compilers the world over, but instead of trying to mimic an operating system it does actually provide some added bang for the bytes it takes up.

This layer is the 'stdio' library. Its pervasiveness is indicated by the ubiquitous '#include <stdio.h>' that appears in almost all C programs. The library is an evolved grab-bag of functions for getting data in to and out of programs in a rather more programmer-friendly way than the simple 'lump of bytes to or from' provided by AmigaDOS. Although stdio still winds up using AmigaDOS at the end of the day, it wraps it up in a neater fashion.

The most common stdio function is printf(), which takes a format string and some arguments, merges them together and prints them out.

This can have a rather unfortunate side effect. A program that simply uses printf(), such as the standard 'Hello World' example known by all C programmers, will cause the compiler to haul in the stdio layer and add it to the program, as well as any other intermediate layers that stdio uses to get its job done (typically resource tracked memory allocation – malloc() and so on). This leads to hordes of assembly-language programmers looking over one's shoulder and sucking in breath between pursed lips before muttering about how they wrote a whole operating system in less than half that amount of memory. (Arguments constructed around the time taken to write and debug equivalent programs in various languages are left as an exercise for the reader...)

Stdio has its own functions for opening and closing files – fopen() and fclose(). The fopen() function takes yet another style of argument to indicate how the file should be opened; there is no deeply logical reason for this, just perversity and progress. There are also equivalents to Read() and Write(): fread() and fwrite(). These again take a slightly different style of argument but appear to operate in the same manner.

There is, however, one major difference between using stdio and going straight to AmigaDOS – buffering.

FASTER DATA

Stdio does not normally transfer a call to fread() directly to an AmigaDOS Read(). It tries to minimise the work that AmigaDOS does by grabbing a large chunk of the file in one go (typically either 512 bytes or 1K) and then divvying that data out in private as further calls are made by the program to fread(), without going back to AmigaDOS until the current chunk of data is exhausted.

The same style of operation is used for writes. Each call to fwrite() or one of the other output functions – fprintf() and fputc(), for example – will accumulate data in a buffer internal to the stdio layer of your program. This data will only be passed to AmigaDOS when the size has reached the buffering threshold. If data is being read in small lumps, tens of bytes or so, then the load

continued on page 80

LISTING 4 • LISTING 4

```
/* Number of bytes to ignore when saving elements
*/
#define SAVE_SKIP       sizeof(struct MinNode)
SaveProject(struct project *poject, char *filename)
{
struct Element *element;
...
for(element = HEAD(&project->elements);
NEXT(element);
element = NEXT(element)) {
/* Start writing SAVE_SKIP bytes from start of element and
* reduce the written size by SAVE_SKIP
*/
Write(filehandle,((char
*)&element)+SAVE_SKIP,sizeof(*element)-SAVE_SKIP);
}
}
```

LISTING 3 • LISTING 3

```
#include <stdio.h>
/* File loading using Stdio style calls
*/
int LoadFromFile(char *name, struct MemoryData *mem)
{
FILE *filehandle;  /** New sort of filehandle (from      ↵
stdio.h) **/
int blocks;
/* Try to open an existing file
*/
filehandle = fopen(name,"rb"); /** Different argument    ↵
used to signify mode **/
if(filehandle == NULL)  /** Different return value on    ↵
error ***/
return 1;
/* Copy data from file to memory
*/
/** Different order and style of arguments -
Pointer to memory
Size of a block
Number fo blocks
File handle
**/
blocks = fread((void *)mem, sizeof(*mem), 1, filehandle);
if(blocks != 1) {
/** Program can be safely aborted without explicitly     ↵
closing files
**/
exit(10);
}
/* Close the file
*/
fclose(filehandle);
}
```

LISTING 5 • LISTING 5

```
/* There is a global array of these structures, containing  ↵
useful information
* and function pointer particular to each element type.
*/
struct ElementActions {
/* If non NULL, a function pointer to call during element  ↵
creation
*/
void (*initialise)(struct Element *);
/* If non NULL, a function pointer to call during element  ↵
deletion
*/
void (*delete)(struct Element *);
/* If non NULL, a function pointer to draw the one these   ↵
elements
*/
void (*draw)(struct DrawInfo *, struct Element *);
/* If non NULL, a function pointer to draw the select      ↵
highlighting for
* one of these elements
*/
void (*draw_select)(struct UserWindow *, struct DrawInfo *, ↵
struct Element *);
/* An ASCII charcter used to identify this type of element ↵
is save files
*/
char file_ident;
/* A function pointer to add the data particular to this
* sort of element to a save file
*/
void (*save)(FILE *, struct Element *);
/* A function pointer to read the data particular to this
* element from save file
*/
void (*load)(FILE *, struct Element *);
};
```

continued from page 79

that this buffering takes off AmigaDOS can drastically improve the speed of some programs.

A version of the LoadFromFile() routine that uses stdio can be studied in Listing 3.

The fread() function differs from the previous byte-reading calls in that it splits the requested amount of data into numbers, the size of each block of data, and number of such blocks to be read. In Listing 3 each block is the size of the MemoryData structure, and only one is required. The return value is specified in terms of the number of complete blocks read.

BACK TO THE PROJECT

Having detoured through the various levels of file handling available from the C compiler, the subject of how to implement load and save in the *ADraw* project returns.

All the above examples have simply copied a block of data from memory to disk, and then reinstated the data in memory. For many sorts of data this is a fast and easy approach; integers, floating point numbers, characters and strings will all survive this passage via a file, and appear just as before.

A pointer subjected to this method of file handling will also be restored exactly as it was in the saving program – unfortunately, this is not at all what is required. The actual byte value of a pointer is only meaningful in terms of what it references elsewhere in memory. None of the above saving and loading makes any guarantees about where in memory things will return to once reloaded. The bytes may be the same, but the position will most likely be different.

For pointers, this is disastrous. A linked list that was set up in the saving program will come back completely unlinked, as the faithfully reproduced values of the original pointers mean nothing in the loading program.

To solve the problem of saving complex data structures, we need to convert them into a different format that can, on reloading, be reconstituted into a similar data structure. *ADraw* projects consist of doubly linked lists of elements in memory. When saved to a file the double linkage is forgotten, the project elements are simply written in order to the file. On reloading, the linkage is rebuilt.

A simple solution would be to write out each element excluding the node structure at the front (Listing 4). This is not ideal, as it ignores the fact that some elements have further pointers buried in them – text elements have pointers to strings and lines have linked lists of points.

To get round these problems, *ADraw* does not try to be efficient or even use a format which remotely resembles that with which the data is stored in memory. The major decision is that the saved project files are in readable ASCII text. The reasons for this are the availability of text reading and writing functions in the stdio library, and the ease of debugging by simply using the 'type' command from the Shell or some form of text editor to see if the data has come out correctly. If the file was in binary it would appear (even when correct) as complete garbage when examined in this way. Making use of the 'type opt h' command to see what was really in the file would work, but would take some mental effort to decipher.

The file format is as follows:

- Each item in the project is represented by one line of text in the data file.

- The first character identifies which particular type of item is involved.

- The next items on the line are text versions of the data that is common to all types of element – position, colour and so on.

- Following the common data is whatever extra data describes this particular sort of primitive – width, height, radius or whatever.

For example, the sample project outlined at the start of this article would look like like the following when saved to disk:

```
B 100 100 0 1 2 0 150 40
C 50 80 0 1 2 0 30
L 100 100 0 1 2 0 150 150 ↵
200 100
```

The first characters of each line are B, C and L – for Box, Circle and Line respectively. The next two numbers are the X and Y positions in project units. For example, the circle is centred at 50,80.

The next four numbers are the same for each primitive in this example, and are the four graphic style options – foreground colour, background colour, outline colour and draw mode. These are the parameters that are passed directly to the Amiga graphics library before a primitive is drawn.

The meaning of the rest of each line differs. The box has two remaining numbers, 150 and 40 – the width and height of the box. The circle has one number, a radius of 30. The line has two pairs of numbers, representing the remaining points on the line: (150,150) and (200,100).

A TWO-PART SAVE

To create this data file, the structure introduced in the last article needs extending. The save function will be split into two parts: that which is common to all primitives, and that which is particular to each sort of primitive.

All the code that is particular to each primitive in the whole program is referenced through one array, ElementActionsTable[]. This is an array of structures, one for each sort of primitive. Each structure then contains pointers to pieces of code

LISTING 6 • LISTING 6

```
void SaveProject(struct Project *project, char *filename)
{
struct FILE *filehandle;
struct element *element;
/* Open the output file for writing using stdio
*/
filehandle = fopen(filename,"w");
if(filehandle == NULL) {
FileError(filename);
return;
}
/* Walk along the list of elements for this project
*/
for(element = HEAD(&project->elements);
NEXT(element);
element = NEXT(element)) {
/* Write out the information common to all elements
*/
fprintf(filehandle,"%c %d %d %d %d %d %d ",
ElementsActionsTable[element->type],   /* identifying      ↵
character */ element->x, element->y, /* position */
element->fg_colour,element->bg_colour,/* coulour and      ↵
style */
element->outline_colour,
element->draw_mode);
/* Call a function from ElementActionsTable[] to write out
* rest of this element
*/
(*ElementActionsTable[element->type].save)(filehandle,    ↵
element);
/* Finish the line
*/
fprintf(filehandle,"\n");
}

/* Finished walking list - close the file
*/
fclose(filehandle);
/* Having sucessfully saved the file, clear the            ↵
'modified' flag
* on the project to indicate that the user does not       ↵
need querying
* of they quit before making any further modifications
*/
project->flags &= ~PRJ_MODIFIED;
}
```

LISTING 7 • LISTING 7

```
void SaveBox(struct File *filehandle, struct Element
*element)
{
fprintf(filehandle,"%d %d",element->e.box.width,element-   ↵
>e.box.height);
}
void SaveCircle(struct File *filehandle, struct Element
*element)
{
fprintf(filehandle,"%d %d",element->e.circle.radius);
}
```

for various actions. So far these actions have been: Initialisation, Deletion, Drawing and Drawing Selected.

To support saving and, later, loading, the structure is extended (Listing 5).

To save a project, the list of elements is processed. For each one, first the general information is written out and then a function pointer is called to write out the data specific to each type of element (Listing 6). Some of the element-specific functions that are referenced via ElementActionsTable[] are shown in Listing 7.

To load the file generated by this process requires that the file be opened for reading. For each line in the file a new element is allocated, and the general part of that structure is filled with data from the first part of the line. That done, a function is called to read the remainder of the line, particular to each type of element. Finally the new element is added to the tail of the current project list (Listing 8).

ADraw can now load and save files, albeit not very efficiently.

Having got the ASCII text-based loading and saving working, it is relatively easy to make the program output raw data instead of text. The general format of the data would remain much the same, but instead of numbers being converted to text and back, they would be stored in the file as the direct bytes from memory representing that number. Thus the time taken for the numeric conversion to and from ASCII would be saved.

A further refinement would to to use the IFF format for saving binary data. This format, a standard instigated by Commodore and Electronic Arts, has been adopted for many other products. The most common type is an ILBM, or bitmap picture file as produced by *DPaint*, but the format is suitable for almost any structured data storage.

An advantage to using IFF is that programs can dig out sections of the file that they understand, and ignore the rest. This means that *ADraw* could include an ILBM subsection representing a screen dump of the saved project in its save files. It would then be possible to get a rough idea of what each of the saved projects on disk looked like using one of the existing ILBM file viewers. These would ignore the real *ADraw* data in the file and go for the bit they understood, the bitmap picture, and display it on screen.

AND FINALLY...

This series has covered various aspects of a medium-sized Amiga application. Hopefully, it has given some clues as to the methods available for getting an application going.

There are hundreds of enhancements that could be made to *ADraw*; however, the basic structure of the application is there and so far it has remained exceedingly simple.

Two big pitfalls of getting an application going have (so far) been avoided. A good way to stymie a program is by excess optimisation – spend all the time on it optimising for speed and size, and missing out the usability or never quite fixing all the bugs that have been hidden in the fast but strange code. And trying to add every feature that springs to mind before a consistent framework is in place leads to big programs (lots of places for bugs) that can get distinctly unusable – with several ways of accomplishing the same thing buried in different parts of the code.

Another big pitfall is not writing anything at all.

But given a computer, a compiler and some inspiration, there must be something that springs to mind!

Those readers with access to the CIX on-line conferencing system will find the full source code to* ADraw*, along with an executable version of the program, in the 'amigashopper' conference. If you make any changes or improvements to* ADraw*, please feel free to write in and let us know what you have done. AS

JARGON BUSTING

Intuition – The part of the Amiga's operating system concerned with window handling, menus and so forth. It interprets user input from the mouse and sends information to the relevant windows via the Intuition Direct Communication Message Ports (IDCMP).

Linked list – A method of storing data. The data is collected into a series of similar groups or records; part of the data in each of these records is a pointer to the next record in the list. The last record will typically have the value 'NIL' in its pointer location, signifying that no other records follow it. Linked lists are a useful method of storing large, varying numbers of data records in memory.

SHOPPING LIST

SAS C £229
Imported by HiSoft
The Old School, Greenfield
Bedford MK45 5DE
☎ 0525 718181

PowerWindows V2.5 ....£69
Imported by Checkmate Digital Ltd.
80 Mildmay Park
London N1 4PR
☎ 071-923 0658

C – A Dabhand Guide..........£14.95
Published by Dabs Press
Computer Manuals Ltd
☎ 021-706 6000

Amiga C for Beginners £18.45
Published by Abacus
Computer Manuals Ltd
☎ 021-706 6000

Amiga C for Advanced Programmers. £32.45
Published by Abacus
Computer Manuals Ltd
☎ 021-706 6000

The C Programming Language £24.95
Published by Prentice Hall
Computer Manuals Ltd
☎ 021-706 6000

LISTING 8 • LISTING 8

```
void LoadProject(struct Project *project, char *filename)
{
struct FILE *filehandle;
struct element *element;
char type_chr;
int i;
/* Open the output file for reading using stdio
*/
filehandle = fopen(filename,"r");
if(filehandle == NULL) {
FileError(filename);
return;
}
/* Loop while there are still lines to be read from the file
*/
while(!feof(filehandle) {
/* Allocate the new element strucure
*/
element = AllocMem(sizeof(*element),MEMF_CLEAR);
if(element == NULL) AllocError(AE_ELEMENT);
/* Fill in general information and read the type letter
*/
fscanf(filehandle,"%c %d %d %d %d %d %d ",type_chr,
&element->x, &element->y, /* position */
&element->fg_colour,&element->bg_colour, /* colour and ↵
style */
&element->outline_colour,
&element->draw_mode);
/* Find the element type that mathes the type character
*/
for(i=0; i< NUM_ELEMENTS; i++)
if(ElementActionsTable[i].file_ident == type_chr)
break;
/* If above loop ran to completion, then no match was ↵
found */
if(i >= NUM_ELEMNTS) {
FatalError("unrecognised element type in file");
return;
}
/* Call special case function to read in rest of elment
*/
(*ElementActionsTable[i].load)(element);
/* Add new element to end of project
*/
ADDTAIL(&project->elements,element);
}
/* Close the input file
*/
fclose(filehandle);
}
```

Grappling with gadgets

NEW SERIES

> "People who program in Basic sometimes have trouble getting to grips with library calls. If you're one of those people, read on..."
> **Dean Cracknell**

Dean Cracknell takes a look at how you can use the Amiga's built-in system libraries to give your GFA Basic programs a proper Intuition look and feel

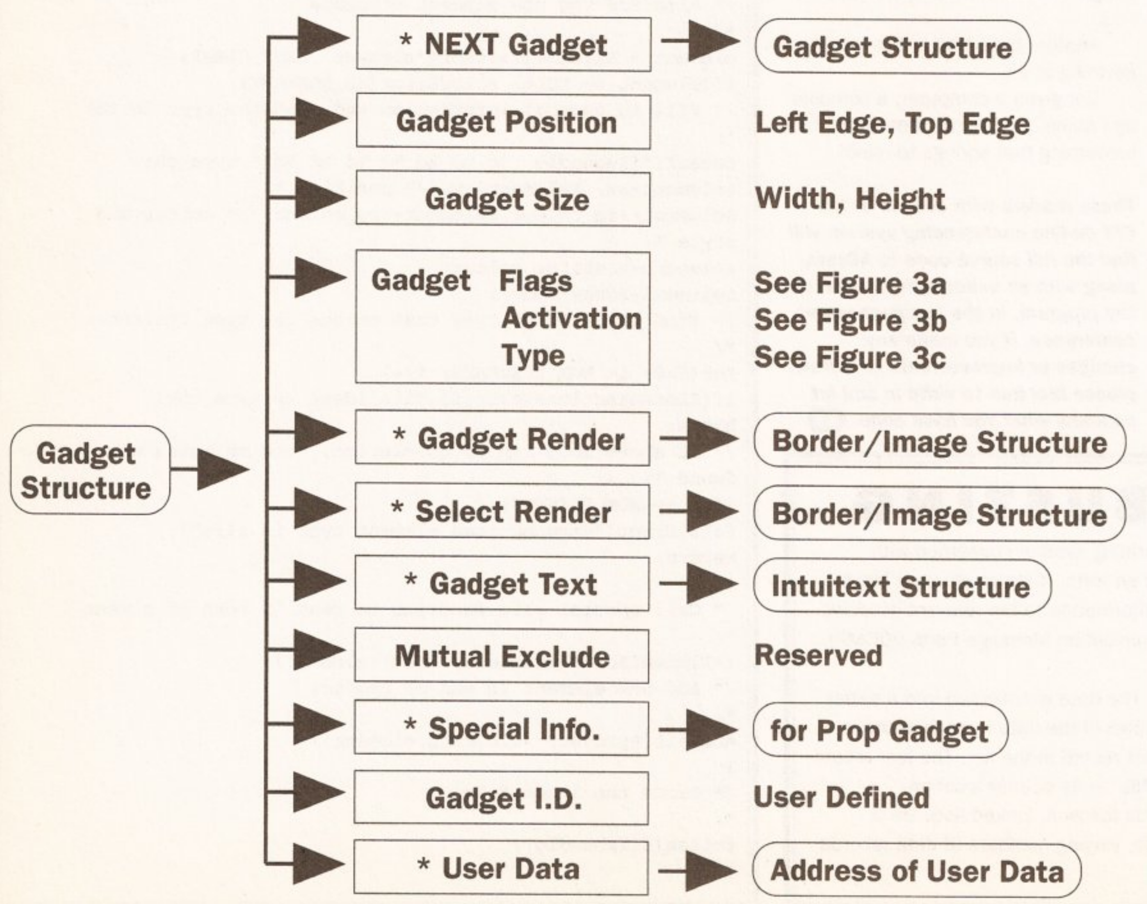
Versions of Basic are relatively similar to each other – that is one of the major advantages of the language. However, GFA Basic has some little quirks and peculiarities all of its own, and for this reason many programmers – even experienced ones – find themselves consulting the manual frequently.

On doing that, you soon discover that GFA's irregularities are not only confined to the language but extend to the layout of the manual and the descriptions therein. However, it does follow some sort of bizarre logic, so after a while things start to make sense, and you can generally find the answer you are looking for.

Until you get to Section 11, the system routines, that is, where you find nearly 100 pages devoted to library calls without a word of explanation on how to use them.

To find explanations, another book is required – the *Amiga ROM Kernel Reference Manual: Libraries & Devices*. This is a beautifully detailed, well-written description of the system library calls function, crammed with worked examples of how to set up the data and subsequently call each routine. (At this point it is worth pointing out that the Amiga operating system was not written in Basic.) Unfortunately this manual is entirely devoted to C programmers and is of little use unless you are fluent in that language and its structures and data-pointers, as well as having access to the C header files that contain the definitions of all the structures. The contents of the header files can be found in yet another technical manual – the *Amiga ROM Kernel Reference Manual: Includes & AutoDocs*, which has all the readability of a Swahili telephone directory.

FIGURE 1 – GADGET STRUCTURE



AIMS AND OBJECTIVES

This series of articles will attempt to bridge the gap between the GFA Basic manual and the *ROM Kernel Manuals* (*RKMs*) by giving examples of how to set up your own custom gadgets. But nothing can replace the *RKMs*; if you want to program the Amiga properly you need these books, starting with *Libraries & Devices*.

Gadgets, for those not used to Amiga terminology, are things like the requesters and system dialogue boxes which make an Amiga program into an Amiga program. Many Basic programmers don't bother with them – but programs which use gadgets always look more impressive and professional that those which don't.

Remember when you are experimenting with system calls that GFA Basic leaves the error handling up to the operating system, so the odd Guru Meditation will occur, regardless of how careful you are – so make sure you save your programs before running them.

Before we begin, here are the only things you actually need to know about C:

- A 'structure' is similar to an array in Basic, except that each element in a structure can be a different data type.
- 'Pointers' are variables that hold memory addresses where the data can be found. In C, pointers can be easily identified because the are prefixed with a '*'. If the pointer is used without the '*' then it will

return the address of the data; with the '*' the data at that address will be returned.

- The C header files contain all the structure definitions and flag values used to set up the data used by the system library calls. We do not have these header files.

GADGETS

Gadgets are areas of the screen which respond when clicked with the mouse pointer. These gadgets come in many guises – disk, drawer and project icons, for example, are all examples of gadgets.

When you open a drawer on the desktop, the resulting window which appears contains 11 gadgets around its border that have been set up by the system so that you can control the window – its position, size and so on.

There are, though, only three distinct types of gadget, classified by their method of operation: Boolean, String and Proportional.

A much simplified gadget structure is shown in Figure 1 on the opposite page. The gadget structure consists of some data which is used to position the gadget, and list of pointers to other data structures which will contain information that will be used to finally draw the gadget on the screen.

The rendering that will be used to create the gadget can be one of two distinct forms: Border, which usually comprises some text surrounded by a box; and Image, which is a pictorial graphic like the Workbench's Disk and Project icons. The 'alternate' image is an optional image that can be used to show that the gadget is selected, and must be of the same render type as the unselected gadget. If an alternate image is not provided, then there are a number of ways that Intuition can be used to highlight the selected gadget automatically.

The C header file 'intuition.h' contains a definition of a structure

> **"The odd Guru Meditation will occur, regardless of how careful you are"**

that is used to define a gadget, which is shown in Figure 2a along with the number of bytes which each part of the structure requires. At this point the structure does not exist, and no memory has been allocated to store the information – it is merely a definition of what the structure will look like when it is eventually declared.

Do not worry about exactly what the structure means; all we are interested in at the moment is how much memory to reserve for it in Basic. In C a BYTE and a UBYTE are one byte long; a SHORT and a USHORT are two bytes long (the same as a WORD in Basic); a LONG is four bytes; and all pointers – including APTRs – are also four bytes. By adding up all the memory used, we can calculate how much space is required each time a border structure is declared:

4+2+2+2+2+2+2+2+4+4+4+4+4+2 +4 = 44 bytes.

Because *GFA Basic* does not have data structures, we have to create them ourselves. The first step in achieving this is to allocate some memory, and the simplest and most reliable way of doing this is to use the INLINE statement:

```
INLINE my1gad%,44
```

The statement above reserves 44 bytes for the gadget structure, and sets the variable called 'my1gad%' to hold the start address of this space. In another implementation of Basic we would then proceed to POKE our data into the structure. Fortunately, GFA makes life a little easier and the technique we would use is shown in Figure 2b below.

When more than one gadget is to be active on the screen at the same time, they must be linked together in a chain. To do this, the first gadget contains the address of the second, the second has the address of the third and so on and, eventually, the last gadget will have its link address set to zero.

Over the next couple of months, we will be printing six listings which show how this particular structure is used; they will employ the same principles to create all the other

> **BLITS & BOBS**
>
> *Basic stands for Beginners' All-purpose Symbolic Instruction Code. It was invented in America to teach students the rudiments of programming, and is now the most widely-used programming language in the world – despite having numerous detractors.*

structures needed. The listings will contain a number of different gadgets to show the effects of the various flags; these flags are summarised in Figures 3a, 3b, 3c and 3d over the page.

BOOLEAN GADGETS

A boolean gadget is one that acts like a switch – so it will be either on or off. Our listing this month shows how to implement such a gadget in GFA Basic.

The program shown in listing 1 sets up two windows; the first is where the gadgets will appear, and the second is used to display messages about the states of the gadgets. The program provides two gadgets – one will switch on when

continued on page 84

FIGURE 2a

STRUCTURE DEFINITION	BYTES REQ'D
struct Gadget {	
struct Gadget *NextGadget;	4
SHORT LeftEdge;	2
SHORT TopEdge;	2
SHORT Width;	2
SHORT Height;	2
USHORT Flags;	2
USHORT Activation;	2
USHORT GadgetType;	2
APTR GadgetRender;	4
APTR SelectRender;	4
struct IntuiText *GadgetText;	4
LONG MutualExclude;	4
APTR SpecialInfo;	4
USHORT GadgetID;	2
APTR UserData;	4
}	
	TOTAL = 44 bytes

FIGURE 2b

```
'
' Create the Gadget Structure
'
LONG{my1gad%+ 0}=0          ! Pointer to next gadget
WORD{my1gad%+ 4}=40         ! LeftEdge
WORD{my1gad%+ 6}=20         ! TopEdge
WORD{my1gad%+ 8}=71         ! Width
WORD{my1gad%+10}=11         ! Height
WORD{my1gad%+12}=0          ! Highlight by compliment
WORD{my1gad%+14}=2+1        ! Report Pressed & ↵
                              Released
WORD{my1gad%+16}=1          ! Type=Boolean Gadget
LONG{my1gad%+18}=my1brdr%   ! GadgetRender
LONG{my1gad%+22}=0          ! SelectRender
LONG{my1gad%+26}=itext1%    ! The Text
LONG{my1gad%+30}=0          ! MutualExclude
LONG{my1gad%+34}=0          ! Special Info (NONE)
WORD{my1gad%+38}=1          ! GadgetID (user defined)
LONG{my1gad%+40}=0          ! Pointer to UserData
```

continued from page 83

pressed and then switch off when released, the other will toggle on with the first press, off with the second and so on. These gadgets do not have alternate images, but will be highlighted automatically when they are selected.

The program initially reserves some memory for the structures that the program will need, and then sets up an array of x and y coordinates of a box. This array is linked to a border structure which, with the 'PRESS ME' text structure (underneath the border structure, known as an IntuiText structure) will be used to render the complete gadget image in the third structure, which is the gadget structure of the first gadget.

To create the second gadget, a copy is made of the first, a new IntuiText object is linked in and the activation-flag is changed to make it toggle when selected.

Having set up all the data structures that are required, and opened some windows to write to, the next step is to invoke the AddGList system call, which will add our gadgets to Intuition's gadget list, and then call RefreshGadgets to draw them on-screen in the specified window.

Once added to the gadget list, the gadget becomes active – Intuition takes over control of it, leaving the program free to do other things. When the gadget is clicked on, Intuition sends an interrupt message via the the Intuition Direct Communications Message Port, or IDCMP, to our program. To enable the program to receive these messages, the ON MESSAGE GOSUB statement is used. In the example program, all we do is SLEEP while waiting for this message.

The final system call is to RemoveGList, which will remove our gadgets from the gadget list once we have finished with them. The rest of the listing deals with the IDCMP event-capturing to detect that a gadget has been pressed, which is covered in Section 9 of the GFA Basic manual and illustrated in the supplied 'WINDOW.GFA' example.

Next month we look at how to implement other types of gadget.

SHOPPING LIST

GFA Basic Interpreter £49.95

GFA Basic Compiler (interpreter required) £29.95

Available from:
GFA Data Media (UK) Ltd
Kingswood House
12 Shute End
Wokingham
Berkshire
RG11 1BJ
☎ 0734 794941

FIG 3a – GADGET FLAGS

These flags determine the highlighting method for the gadget when selected:

GADGHCOMP	&H0000	Compliment the gadget
GADGHBOX	&H0001	Draw a box around the gadget
GADGHIMAGE	&H0002	Use an alternate image
GADGHNONE	&H0003	none

This flag is set when the gadget has an image:

GADGIMAGE	&H0004

The folowing are used to tag a gadget to a particular window edge:

GRELBOTTOM	&H0008	Relative to the bottom border
GRELRIGHT	&H0010	Relative to the right border

The next two flags allow the size of the gadget to change automatically when the indow size changes:

GRELWIDTH	&H0020	Relative to the width
GRELHEIGHT	&H0040	Relative to the height

The final flag is used to start the gadget off in its selected state:

SELECTED	&H0080

FIG 3b – ACTIVATION FLAGS

When the next two flags are set, the program will be informed when the gadget is ressed or released:

RELVERIFY	&H0001	Release verify
GADGIMMEDIATE	&H0002	Message sent when pressed

The next four will position the gadget in one of the window's four borders:

RIGHTBORDER	&H0010
LEFTBORDER	&H0020
TOPBORDER	&H0040
BOTTOMBORDER	&H0080

This flag sets a boolean gadget to toggle mode:

TOGGLESELECT	&H0100

These two are for string gadgets:

STRINGCENTER	&H0200
STRINGRIGHT	&H0400

The final activation flag converts a string gadget to an long integer gadget:

LONGINT	&H0800

These tables lists the flags used by the various structures needed to set up Intuition gadgets. The standard names for these from the C header files have been used, but to use them in other languages, such as GFA-Basic, their numeric values (&Hxxxx) are required.

FIG 3c – GADGET TYPES

The codes for the three gadget types are:

BOOLGADGET	&H0001
PROPGADGET	&H0003
STRGADGET	&H0004

The GimmeZeroZero flag is used when the window type is GimmeZeroZero and allows gadgets to be placed in the borders:

GZZGADGET	&H2000

FIG 3d – PROPINFO FLAGS

The proportional gadget has its own set of flags in the PropInfo structure, these determine the nature of the gadget. The first flag allows Intuition to create the gadget knob; if this bit is not set then the user must supply an image structure for the knob:

AUTOKNOB	&H0001

These determine the type of slider to make:

FREEHORIZ	&H0002
FREEVERT	&H0004

This bit can be examined by the application program:

KNOBHIT	&H0100	Set by Intuition

Set the next if you do not require a box to be drawn around the slider:

PROPBORDERLESS	&H0008

LISTING 1 ● LISTING 1 ● LISTING 1 ● LISTING 1 ● LISTING 1

```
'
' Simple Boolean Gadgets Example
'
' Reserve some meory for the various structures
'
INLINE my1brdr%,16
INLINE imsg1%,16
INLINE itext1%,20
INLINE my1gad%,44
INLINE imsg2%,16
INLINE itext2%,20
INLINE my2gad%,44
DIM my1points&(10) ! The Boxes
'
' First Gadget
'
' gadget border box-drawing co-ordinates
'
my1points&(0)=0
my1points&(1)=0
my1points&(2)=70
my1points&(3)=0
my1points&(4)=70
my1points&(5)=10
my1points&(6)=0
my1points&(7)=10
my1points&(8)=0
my1points&(9)=0
'
' gadget border structure
'
WORD{my1brdr%+0}=0                  ! Left Edge
WORD{my1brdr%+2}=0                  ! Top Edge
BYTE{my1brdr%+4}=1                  ! Front Pen
BYTE{my1brdr%+5}=0                  ! Back Pen
BYTE{my1brdr%+6}=0                  ! Draw Mode (JAM1)
BYTE{my1brdr%+7}=5                  ! Byte Count
LONG{my1brdr%+8}=V:my1points&(0)    ! 5 co-ord array
LONG{my1brdr%+12}=0                 ! Pointer to Next Border
'
' The Gadgets Message Structure
'
@strcpy(imsg1%,"PRESS ME")          ! The First Gadgets Text
'
BYTE{itext1%+0}=1                   ! Foreground Pen
BYTE{itext1%+1}=0                   ! Background Pen
BYTE{itext1%+2}=0                   ! JAM1
BYTE{itext1%+3}=&HA                 ! dunno
WORD{itext1%+4}=4                   ! Left Edge
WORD{itext1%+6}=2                   ! Top Edge
LONG{itext1%+8}=0                   ! ITextFont (NULL)
LONG{itext1%+12}=imsg1%             ! The Text to be Displayed
LONG{itext1%+16}=0                  ! NextText (NULL)
'
' Create the Gadget Structure
'
LONG{my1gad%+0}=0                   ! Pointer to next gadget
WORD{my1gad%+4}=40                  ! LeftEdge
WORD{my1gad%+6}=20                  ! TopEdge
WORD{my1gad%+8}=71                  ! Width
WORD{my1gad%+10}=11                 ! Height
WORD{my1gad%+12}=0                  ! GADGEHCOMP
WORD{my1gad%+14}=2+1                ! GADHIMMEDIATE | RELVERIFY
WORD{my1gad%+16}=1                  ! BOOLGADGET
LONG{my1gad%+18}=my1brdr%           ! GadgetRender
LONG{my1gad%+22}=0                  ! SelectRender
LONG{my1gad%+26}=itext1%            ! The Text
LONG{my1gad%+30}=0                  ! MutualExclude
LONG{my1gad%+34}=0                  ! Special Info (NONE)
WORD{my1gad%+38}=1                  ! GadgetID (user defined)
LONG{my1gad%+40}=0                  ! Pointer to UserData
'
' Second Gadget
' This will be similar to 1st, but with different text, position
' and activation mode (it will Toggle ON/OFF with each press)
@strcpy(imsg2%,"OR ME")             ! The new text
BMOVE itext1%,itext2%,20            ! Copy from 1st Gadget
WORD{itext2%+4}=16                  ! Add the new Left Edge
LONG{itext2%+12}=imsg2%             ! Change the Text to be ↵
                                      Displayed
'
BMOVE my1gad%,my2gad%,44            ! Copy new structure from ↵
                                      1st Gadget
WORD{my2gad%+4}=140                 ! Add the new Left Edge
WORD{my2gad%+12}=1                  ! draw a box when selected
WORD{my2gad%+14}=&H100+2+1          ! TOGGLESELECT + as gad1
LONG{my2gad%+26}=itext2%            ! Add the new IntuiText
                                      Structure
WORD{my2gad%+38}=2                  ! change the GadgetID
'
' now all we have to do is link the two together...
'
LONG{my1gad%+0}=my2gad%
'
' Open a couple of Windows to display the Gadgets'
idcmp%=&H260              ! tell me if Window-Close or ↵
                            Gadget is UP or DOWN
OPENW #1,0,20,319,70,idcmp%,&HF
TITLEW #1,"Window #1 - with 2 Gadgets"
LOCATE 7,5
PRINT "Two Boolean Gadgets"
PRINT
PRINT "   Close this Window to quit"
idcmp%=&H0       ! don't tell me anything from this window
OPENW #2,321,20,319,100,idcmp%,&HF
TITLEW #2,"Window #2 - IDCMP Data "
'
' Add the two new Gadgets to Window 1
'
fred=AddGList(WINDOW(1),my1gad%,-1,2,0)
~RefreshGadgets(my1gad%,WINDOW(1),0)
'
PRINT "Gadget ";fred;": ";HEX$(my1gad%,6);"     ";
PRINT "Gadget ";fred+1;": ";HEX$(my2gad%,6)
PRINT "Window 1: ";HEX$(WINDOW(1),6);"     ";
PRINT "Window 2: ";HEX$(WINDOW(2),6);" ";
'
ON MESSAGE GOSUB what_message
'
wclose!=FALSE
REPEAT
SLEEP
UNTIL wclose!
'
' Clean-up Memory - BASIC doesn't automatically ↵
de-allocate on exiting
'
fred=RemoveGList(WINDOW(1),my1gad%,2)
DELAY 1          ! 1 second delay to see CLOSE WINDOW message
CLOSEW #1
CLOSEW #2
END
'
PROCEDURE what_message
LOCAL wad%,wnr%,msg%,gadno&
'
wad%=MENU(9)                        ! Window Address
wnr%=WINDOW(wad%)                   ! Window Number
msg%=MENU(1)                        ! IDCMP-Flags
IF msg%=&H40 OR msg%=&H20 THEN
gadno&=WORD{MENU(4)+38}             ! Read which Gadget
ENDIF
LOCATE 1,4
PRINT
PRINT "Window: ";wnr%;" "
PRINT "ICDMP Message :";HEX$(msg%,4);" "
SELECT msg%
CASE &H20
PRINT "GADGET ";gadno&;" DOWN     "
IF (WORD{my2gad%+12} AND &H80)=&H80 THEN
PRINT "Gadget 2 is Selected"
ELSE
PRINT "                    "
ENDIF
CASE &H40
PRINT "GADGET ";gadno&;" UP       "
CASE &H200
PRINT "CLOSE WINDOW"
wclose!=TRUE
ENDSELECT
RETURN
PROCEDURE strcpy(dst%,src$)
'
' this procedure performs the same function as
' CHAR{dst%}=src$, which works fine in the interpreter
' but doesn't compile properly (for some reason...)
'
  src$=src$+CHR$(0)
  adr%=V:src$
  leng=LEN(src$)
  BMOVE adr%,dst%,leng
RETURN
```



For the best in Educational Software

Subjects

- French, Spanish
- German, Italian
- Science, History
- Geography
- English Words
- Spelling
- Arithmetic
- Football, Sport
- First Aid
- General Knowledge
- England, Scotland
- Natural History

Kosmos are specialist producers of Educational Software designed to help you enjoy learning from your computer. Versions are available for most popular home & business computers. Many of our programs even allow you to add your own lesson material.

⇓

Write or telephone for a FREE 20-page BROCHURE of our Educational & Leisure software

Please state your computer type

Kosmos Software Ltd, FREEPOST (no stamp needed in UK)
DUNSTABLE, Beds. LU5 6BR
Telephone 05255 3942 or 5406

Access — KOSMOS SOFTWARE — VISA

GPS

All software includes first class postage. Please add £9 for courier delivery of hardware.

Tel: (0268) 782949. "STOCKS SUBJECT TO AVAILABILITY".

AMIGA HARDWARE

A500 "no software"	£299.95
A500 "Screen Gems"	£349.95
A500 "Screen Gems" + A501	£359.95
A500 "Class of the 90's"	£514.95
A500 "First Steps"	£514.95
A1500 "Base Unit"	£599.95
A1500 "Base Unit + Software"	£649.95
A1500 "Base Unit + Software + Monitor"	£899.95
A590 "20MB Hard Disk"	£259.95
A501 'Memory Expansion + Captive"	£54.95
A1084SD "Colour Monitor + Cable"	£244.95
ROTEC RF332C "3.5" Disk Drive"	£54.95
Philips CM8833/2 Colour Monitor	£234.95
CITIZEN SWIFT9 Colour Printer + Cable	£209.95

AMIGA SOFTWARE

AMOS	£32.95
Deluxe Paint II	£19.95
Deluxe Paint III	£59.95
Deluxe Print II	£34.95
Deluxe Video III	£69.95
Disney Animation Studio	£74.95
Kindwords V2.0	£36.95
Mavis Beacon Teaches Typing	£22.95
Pagestream V2.1	£139.95
Pro Page V2.0	£149.95
AT ONCE PC EMULATOR	£169.00
Many other Amiga titles in stock	CALL

AMIGA CONSUMABLES

10 Sony Unbranded 3.5" Disks	£5.95
25 Sony Unbranded 3.5" Disks	£11.95
50 Sony Unbranded 3.5" Disks	£21.95
100 Sony Unbranded 3.5" Disks	£39.95
20 SONY BRANDED 3.5" DISKS + BOX	£17.95
Amiga Connecting Cables	CALL
INTRODUCTION TO AMIGA VIDEO	£14.95
INTRODUCTION TO WORKBENCH VIDEO	£14.95

Please make cheques and postal orders payable to:

GPS,
PO Box 571, Rayleigh, Essex, SS6 9NE
CREDIT CARD HOTLINE: (0268) 782949

VISA — Access

ΔΠΔΠΔΠΔΠΔΠΔΠΔΠΔΠΔΠΔΠΔΠΔΠΔΠΔΠΔΠΔΠΔΠΔΠΔΠ

AUTHORISED DEALER FOR * AMIGA * STAR *

AMIGA (UK MODELS ONLY)

Amiga 1500: B2000 + 1084SD + Twin Floppies + Software		£899.00
As above without monitor		£649.00
XT Bridgeboard + 5.25" Drive + MSDOS 4.01		£199.00
AT Bridgeboard + 5.25" Drive + MSDOS 4.01		£639.00
Supra 8Mb RAM Board Pop 2Mb		£159.00
Supra 8Mb RAM Board Pop 4/6/8Mb		£229/£299/£369.00
A500 CARTOON CLASSICS Pack INCLUDING 512K RAM/CLOCK		£369.00

PRINTERS

Citizen 120D+		£135.00
Star LC-20	*** NEW ***	£149.00
Star LC-200 Colour		£199.00
Star LC24-10		£185.00
Star LC24-200		£229.00
Star LC24-200 Colour		£289.00
Star XB24-200 24 pin Colour	*** NEW ***	£421.83
Star LaserPrinter 4 Postscript		£1126.83
Okimate 20 ribbons/heads/paper		PHONE

MONITORS

Commodore 1084S Stereo		£249.00
Philips 8833-II Stereo Colour		£249.00

DISK DRIVES

A590 Autoboot 20Mb		£289.00
A2000 Internal 3.5"	p&p £2	£69.95
A500 Replacement Internal 3.5"	p&p £2	£59.95
Roctec Super Slim Amiga Ext. 3.5" Metal Cased	p&p £2	£59.95

MISCELLANEOUS

Golden Image Opto-Mechanical Mouse	p&p £1	£22.95
KCS PC Board for A500 inc MSDOS 4.01	p&p £2	£219.00
A500 RAM/Clock 512Kb with Disable Sw	free p&p	£37.00
RAM Chips for A590/2091 per Megabyte	free p&p	£35.00
A500 Compatible Power Supply	free p&p	£49.00
Kickstart V1.3 ROM for A500/2000	free p&p	£29.00
1Mb Fat Agnus 8372A	free p&p	£75.00
CIA Chip 8520	free p&p	£16.00
RGB Composite Video Splitter	free p&p	£69.95

Star Buys for Amiga 1500/2000

Supra WordSync 2000 Drives

52Mb Quantum LPS 17mS with 64Kb Cache	£319
80Mb Seagate 24mS Access Time	£359
105Mb Quantum LPS 17mS with 64Kb Cache	£449

Microbotics VXL-30 Accelerators for A500/2000

25Mhz	£269	25Mhz + 25Mhz	68882	FPU	£399
40Mhz	£399	40Mhz + 25Mhz	68882	FPU	£529

All CPUs 68030. 32-bit RAM Boards Available

Interquad Multiscan Monitor £329

0.28mm Dot Pitch Max Res 1024x768

Flicker Fixers: Microway **£145** Commodore A2320 **£219**

SupraRAM 500RX

2Mb **£189** 4Mb **£279**
6Mb **£369** 8Mb **£459**

ICD A500 INTERNAL Drives

52Mb Quantum LPS **£359**
105Mb Quantum LPS **£499**

Replaces dfo. External drive becomes dfo.

ALL PRICES INCLUDE 17.5% VAT CARRIAGE £5 (EXPRESS £10)

Prices subject to change without notice. E. & O. E.

Delta Pi Software Ltd

VISA

8 Ruswarp Lane, WHITBY, N. Yorks YO21 1ND
TEL/FAX: 0947 600065 (9am - 7pm)

MasterCard

ΠΔΠΔΠΔΠΔΠΔΠΔΠΔΠΔΠΔΠΔΠΔΠΔΠΔΠΔΠΔΠΔΠΔΠΔΠΔΠΔ

New kids in school

Education correspondent Pat Winstanley once again goes back to school to discover the best educational software available.

BEGINNERS START HERE

Those of you who have never seen or played a text adventure may feel more than a little puzzled by the descriptions of *Cave Maze* and *Maths Dragons.* These games do not use either joystick or mouse. Instead, the program is instructed as to its next course of action by commands typed at the prompt (rather like th CLI or Shell).

Adventure programs are used extensively in schools, even for the youngest children where the teacher has to do the actual typing after ascertaining from the group what words should be input. Adventure games are all about logical thought and mapping techniques. Even with a futuristic theme, play is broadly along the lines of a treasure hunt – irresistible to all ages.

Recent years have seen the text/graphics format evolve into a purely graphical environment with games like *Dungeon Master*, *Bard's Tale* and *Eye of the Beholder*, but the central theme of exploration and puzzle-solving remains intact.

In text/graphics adventures, the screen display generally shows a picture of the player's location together with a textual description of what can be seen. The description usually includes both the location itself and any movable objects (those which can be taken or interacted with). In addition, possible exits may be shown as north, south, up, down and so on. Imagine trying to describe a scene in a game such as *Dungeon Master* to a blind person and you get the idea.

Adventurers are, on the whole, very acquisitive persons and will gather up anything they come across in the hope that it will prove useful later. At the time there may be no obvious connection between an arrow, a metal shovel and a hot ember, but reach a wooden fort and the mental connection is soon made. The resultant string of commands such as "carry the ember on the shovel, go to the castle, light the arrow, fire the arrow, wait for the gates to be opened from inside" is the adventure player's dream.

Young children, of course, need rather more simple uses for objects in their adventures. They are perfectly happy to find a key and expect it to open any locked object. Older children will be happy with triangular keys opening only triangular doors, while seasoned adventurers will expect to collect the pertinent key together with knowledge of a magic spell before even attempting to open a door without setting off a booby trap.

While not normally classed as 'educational', there are several text adventures on the market suitable both for children and adult beginners. Early Level 9 titles are simple (with enough devious twists to keep adults guessing), as are some Infocom titles. Unfortunately, both these companies are now defunct, but many discount software vendors (particularly mail order) carry their back catalogue titles.

Also suitable for children are many of the Sierra titles. These are more graphical, but still demand a certain amount of typing. Another series which this time combines joystick dexterity with logical skills are the budget *Dizzy* games from Codemasters. And don't forget *Jungle Bungle* in the AMOS Licenseware collection. Adventures are suitable as a group activity for the whole family, and not infrequently the younger family members come up with the answers to puzzles which have stumped older members for days on end.

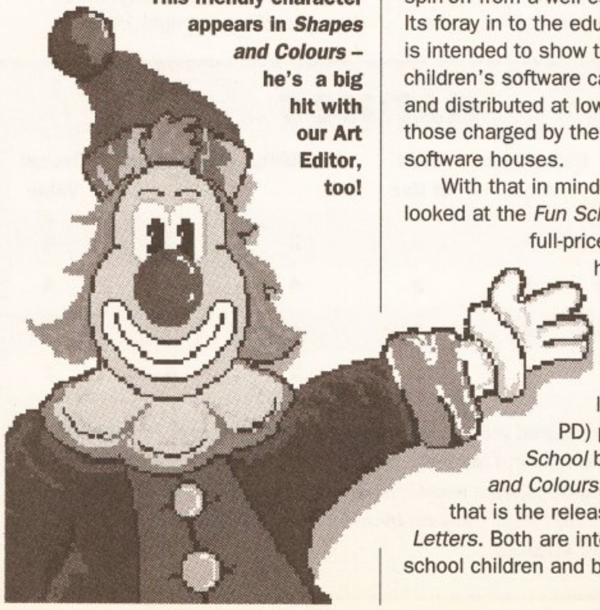
As with arcade games, many organisations and individuals are willing to offer anything from cryptic hints to complete solutions, so there's no need to be stumped for ever. The adventure scene is far less cliquish than the arcade scene, and the fraternity are extremely welcoming to beginners.

Two newcomers to the Amiga scene appear this month, with very different approaches to the world of educational software. Coombe Valley Software has been producing text and graphics adventures on the Atari ST for some time now, and has recently converted two of its games for the Amiga using AMOS. More conversions are promised – and very welcome they are too.

Meanwhile a brand new developer, Rainbow Education, has emerged. The company's aim is to challenge the *Fun School* series with a wide range of kiddies' software at budget prices. At the time of writing two packages are available, and another two should be due by the time you read this.



"Learning is the greatest adventure of all – especially with the Amiga."
Pat Winstanley

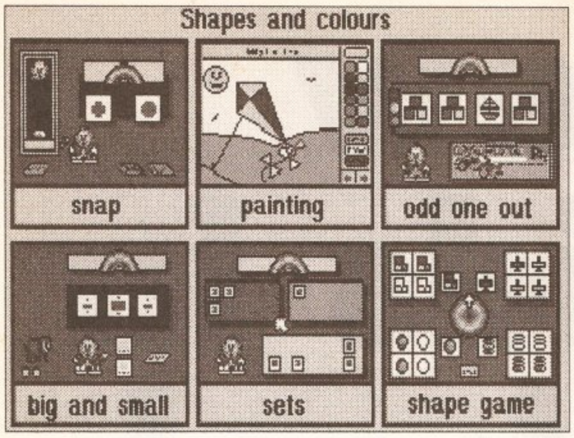


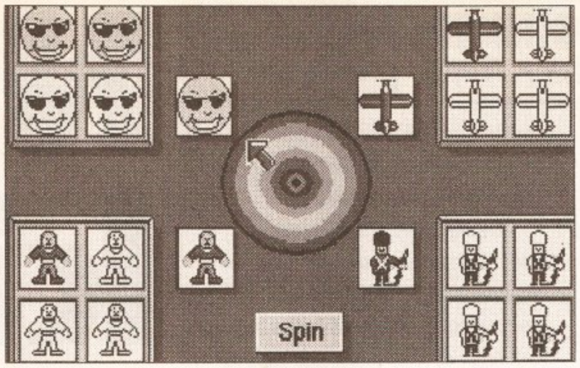
This friendly character appears in *Shapes and Colours* – he's a big hit with our Art Editor, too!

Rainbow Education exists as a spin-off from a well established firm. Its foray in to the educational market is intended to show that good quality children's software can be produced and distributed at lower prices than those charged by the majority of big software houses.

With that in mind, Rainbow looked at the *Fun School* series for a full-priced model and has attempted to match the quality of the Europress offering at a lower (almost PD) price. The *Fun School* buster is *Shapes and Colours*, and alongside that is the release of *First Letters*. Both are intended for pre-school children and both claim to

continued on page 88





***Shapes and Colours* consists of six different games, all accessible from an attractive opening screen (left).**

continued from page 87

prepare toddlers for the rigours of the National Curriculum.

As first attempts, both programs are good enough to take their place in the educational software scene, but somehow lack the polish and attention to detail of some full-priced offerings. However, I feel that Rainbow Education should be roundly applauded for its early efforts – especially with the prices. The publisher is also looking for programmers to do conversion work. Both these packages are written with AMOS and their ST counterparts in STOS, so give Rainbow a ring if you can help.

FIRST LETTERS

Preschool/Infant

Imagine that you have a house consisting of ten rooms plus a garage and garden (you should be so lucky). Then imagine that each room has been infested with a variety of objects, animate and inanimate. So far so good – but what if you have to identify each object and give each one its initial letter? Not such an easy task if you haven't even started school yet.

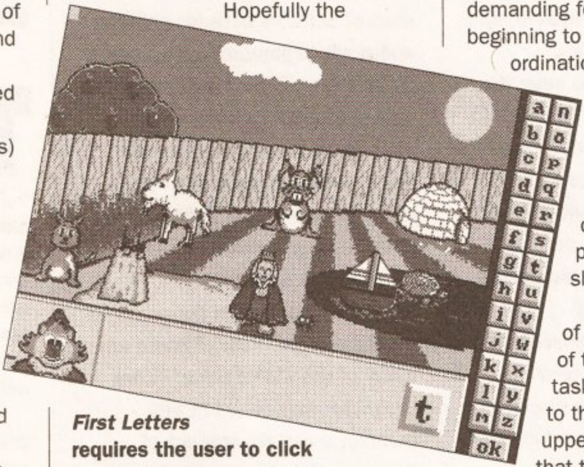
Each room is shown as a scene with ten objects. The objects to be named are animated in turn. As each object is animated the child must click on the initial letter of the object using either the keyboard or the mouse. Unfortunately, some objects are decidedly ambiguous. Thus the animation in the bath is the water level rising – so the tester clicked on W for water. Wrong! It should have been B for bath, and water was not allowed. Similarly, a hand was correctly chosen as H but the next screen showed a similar picture which required A for arm.

My seven year-old found some of the objects easy to both identify and name with their initial letters. However, many objects either defied description or were identified with the incorrect (although synonymous) name and hence were marked incorrectly. Thus P for pan was wrong – it should have been F for frying pan.

While it is good to see excellent and imaginative animation, I feel that the designers have tended to forget their prime purpose – education. As it stands the program is fun and easy to use, but most children will need a good deal of help. Although all the words used in each room are listed both in the instructions and as an option on the screen via the [Help] key, no-readers and those just beginning to read may not recognise the words, and so will need an adult to assist in understanding, rather than in clicking the right letter.

Another point is that there is no provision for older children to try spelling the objects' names. This rather limits the usefulness of the program, since with regular use even younger children will soon learn the object letters by rote.

In all, *First Letters* is a good attempt, but the graphics are rather too ambiguous for both the intended age group and the next one up. Hopefully the programmers will take note of criticism and incorporate suggestions from end-users into their next products. Meanwhile, a good deal of parental co-operation is required to get the most from this product but it's still good value at the price.



***First Letters* requires the user to click on a letter representing the animated character.**

RATINGS

	Educational Value	Ease of Use	Flexibility	Addiction	Overall Value
Cave Maze	4	3	2	4	3
Maths Dragons	5	3	4	4	4
Shapes & Colours	3	4	4	4	4
First Letters	4	3	2	4	3

Successful educational programs, especially those intended for children, need to combine fun with learning. A good educational rating combined with addictiveness shows a well-balanced and valuable resource. Other ratings shown here affect the user-friendliness of the product, reflecting the hassle-factor involved.

SHAPES AND COLOURS

Preschool

Many of the most successful software packages include a colourful character with whom the kids can identify across modules. *Shapes and Colours* is no exception – the character in question is Bobby the clown. Fortunately Rainbow has avoided the standard drawback of making failure more satisfying to the child than success – in fact the company has fallen over backwards to avoid the problem; well done.

Shapes and Colours consists of six games intended to introduce pre-schoolers to just those concepts, and does so admirably well. Like the *Fun School* series, the opening screen displays pictures of each of the six available games, any one of which can be selected by mouse. Some of the individual games can be escaped from during play, but not all – sometimes a little irritating when you realise that you have chosen the wrong option and have to either play the game all the way through or re-boot. All the games except *Painting* and the *Shape Game* offer three levels of difficulty.

Snap is a simple game which merely asks the child to say whether two shapes shown are the same. After five correct answers the child is moved to the next level of proficiency and given three shapes to check.

Painting allows the child to colour in several predefined pictures. Unfortunately it doesn't allow either the saving of masterpieces or loading new ones from other paint packages. The palette can't be changed either, which is a shame.

Odd One Out is for children coming to grips with working out and recognising shapes. It's simple yet demanding for youngsters who are beginning to develop spatial co-ordination skills.

Big and Small shows Bobby directing the child to words (either big or small) and then asking the child to choose the relevant picture from several shown.

Sets offers a mixed bag of pictures at the bottom of the screen. The child's task is to move each picture to the correct area in the upper half of the screen so that they are sorted into the correct groups. Each completed screen sees Bobby give the child a giant thumbs-up and adds a piece to the bonus screen jigsaw. Once the jigsaw is completed the bonus screen animates to activate a Mousetrap-style contraption, culminating in Bobby being woken up by a bucket of water – very satisfying for young children.

Shape Game appears to be either something of an afterthought or a brainstorm on the part of the educational advisor. The game is totally random and features a spinning arrow which, at each spin, points to a different player's counter. Each time the pointer lands on a counter that player 'gets one home'. The winner is the first with four counters home.

IT'S ALL AN ADVENTURE

Although used regularly in schools, the text adventure format has been strangely ignored in the home education market. This is a great shame, since the format itself encourages reading and spelling,

while the puzzles set in the adventure can be anything from general knowledge to pure maths.

The two Coombe Valley games reviewed here were originally written on the ST using *STAC* and have been converted to AMOS for the Amiga – so they appear almost identical to the ST versions on screen. While adequate for the job, AMOS is a bit of a bind for the non-programmer, who might be better off with *Hatrack II* – which is the most user friendly adventure writing system I have seen on any computer (it's available from Heyley Software for £29.95; ring for further details on 061-427 2901). Unfortunately it doesn't as yet support graphics, but there is talk that this might be remedied if enough people want the extra facilities to be added.

Ian Lycett-King, an ex-teacher, is the brain behind Coombe Valley Software and has produced several mind-boggling programs for the ST, now being converted to the Amiga. The following are the first two conversions.

CAVE MAZE

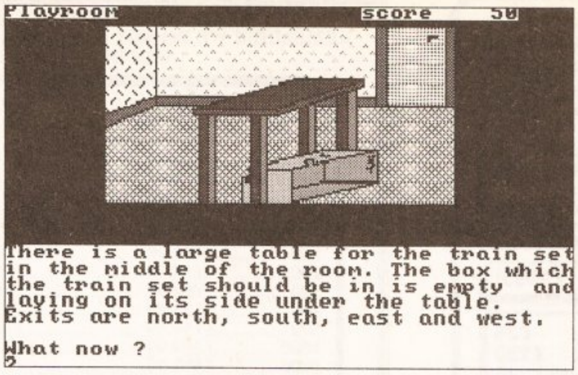
Primary/Early Senior

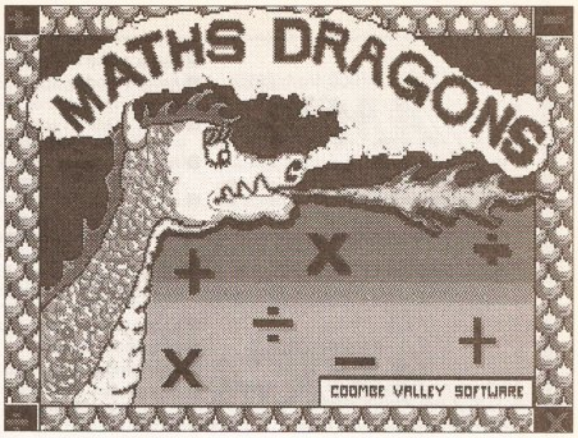
Intended for primary and lower secondary children, this game is a standard text/graphics adventure which encourages logical thinking and planning.

The game is set on a holiday island where a baby dragon has been lost. On stumbling across the dragon, you are informed that it has a map in its lunchbox – but the lunchbox is lost. Your task is to retrieve the lunchbox and unlock it. Only after doing so will you be able to feed the baby dragon and guide it home. Meanwhile, the unfortunate creature is lost and hungry – and touchy with it.

On loading, a copy of the dragon's map is shown on-screen. It's worth making a note of this at once since you won't get to see it again until the lunchbox is unlocked.

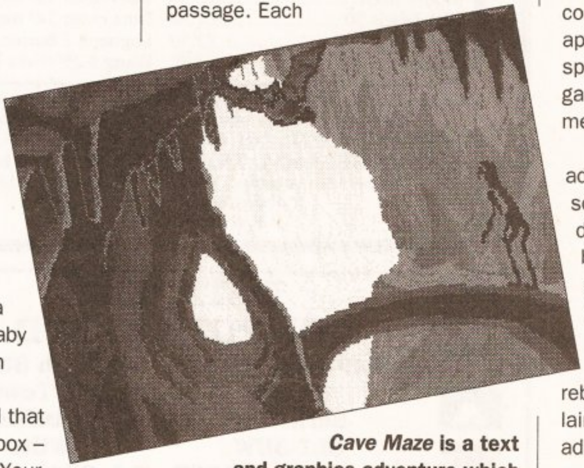
The game uses basic adventure commands (which must be typed) such as get, drop, inventory, look and so on, and incorporates a variety of objects to be manipulated or used as maze markers. Adept adventurers will find the command structure a little primitive, but it is ideal for kids. A phrase such as "get sweets" needs to be typed as two separate commands, the second half being prompted as a response to the first. However, this is fine for younger children who need such a lot of concentration to type commands with the correct spelling that they are liable to only be able to handle one word at a time anyway.





***Maths Dragons* pits the player against a group of benign, numerate dragons. Where's Puff when we need him?**

As play progresses, objects are encountered. The automatic adventuring response is to collect everything and worry later whether it might be of use, but a strict limit is placed on the number of objects which may be carried, so careful choices are required. Later in the game a rather nasty maze is encountered, which contains characters who want a toll to allow passage. Each



***Cave Maze* is a text and graphics adventure which encourages logical thinking.**

requires something different, such as the dog which needs something to occupy him and the troll who fancies something squashy or squelchy. By this means the child is forced to select carried objects carefully to prevent a passage being closed due to lack of further suitable objects.

The game provides a fine test of logic in deciding where best to use different objects, and good practice in map-making. In addition, close reading attention is needed to follow on-screen instructions and location descriptions. All in all, a fine effort and a pleasant change from all the mouse- and joystick-controlled games which abound.

MATHS DRAGONS

Primary/Early Senior

This has to be an all-time favourite with my kids. Set the seven year-old going and he'll monopolise the computer for hours. Despite his appalling reading and even worse spelling there's something about this game which totally grabs him (and me, I might add).

Again we have a text/graphics adventure format. This time the scenario is that while spending the day in the local dragon's lair the baby dragon has scattered all the pieces of your train set. Your task is to wander through the lair collecting the pieces. Having gathered the bits you must then rebuild the track. However, while the lair's inhabitants are friendly, the adults definitely espouse education as a prime virtue in both young dragons and young humans. At random but fairly regular intervals in your wanderings you will encounter adult dragons. While they are kindly souls, they do insist that you answer a sum before continuing on your way. Get the answer wrong and some of your loot will be confiscated and redistributed among the rooms of the lair, for you to collect again.

As with *Cave Maze*, mapping and direction finding is a central theme but this time, instead of collecting objects to help you past obstacles, the theme is arithmetic puzzles. The standard and content of proffered sums can be set at the start of the game. Options range from simple to fiendish (should that be draconian?) and include addition, subtraction, multiplication and division. The size of the numbers used in the sums can also be set, thus making the game suitable for both younger and older children.

Despite text entry being required, only a few words such as 'get' and 'drop' need to be spelled from memory. Object names such as 'engine' and 'signalbox' remain on the screen for the child to copy. I can't recommend this game too highly. It has all the elements that kids enjoy, it isn't too expensive and it has excellent educational content. Well done Coombe Valley. AS

SHOPPING LIST

Cave Maze £12.00
Maths Dragons £12.00

Available from
Coombe Valley Software
18 Nelson Close
Teignmouth
Devon TQ14 9NH
☎ 0626 779695

Shapes and Colours £7.99
First Letters..........................£7.99

Available from
Rainbow educational Software
67 Sidwell Stree, Exeter EX4 6PH
☎ 0392 77369/413104

EDUCATIONAL CONTENT

	Maths	English	Science	Reflex	Logic	Fact	Revision
Cave Maze	Y	Y	N	N	Y	N	N
Maths Dragons	Y	Y	N	N	Y	N	N
Shapes & Colours	Y	N	Y	N	N	N	N
First Letters	N	Y	N	N	N	N	Y

AMIGA — A1500 from £625!

Prices include VAT, delivery & warranty. Please add £15 for overnight delivery. All systems are tested before despatch. On-site maintenance options available.

- Amiga A3000/100, 25Mhz 6MB — £2995
- Amiga A3000/50, 25Mhz 3MB — £2795
- Amiga A1500 latest UK model — £625
- Amiga A1500 as above plus DPaint3, Works Platinum etc — £675
- Amiga A1500 with A2088 PC-XT bridge board & 5¼" disk drive — £825
- Amiga A1500 with A2091 and 50MB Quantum 11ms autoboot hard disk — £1049

■■■ A1500 + XT Bridge Board + 20MB autoboot hard disk £1095!

PERIPHERALS AMIGA

- A2630 card 25MHz/FPU/4MB — £1295
- A2286 PC-AT board & 5¼" drive — £675
- A2088 PC-XT board & 5¼" drive — £225
- C2058 8MB Board, 2MB installed — £184
- RAM for above, per 2MB ... — £72
- Quantum ProDrive 50MB 11ms — £275
- Quantum ProDrive 100MB 11ms — £425
- Quantum ProDrive 200MB 11ms — £725
- A2091 card for ProDrive, 2MB 0K — £189
- RAM for above, per MB (max 2MB) — £36
- External Drive unit for ProDrive — £95
- RAM for A590, 80ns, per MB ... — £36
- KCS PC Power Board ... — £220
- SupraModem 2400 Hayes/AA/AD — £115
- SupraModem 2400 Plus MNP/v42 — £185
- SupraModem 2400zi Plus internal — £169
- MultiScan monitor 14" 1024x768 — £395
- A2320 Display Enhancer for above — £249
- HP DeskJet 500 inkjet, 300 dpi — £445
- HP PaintJet colour inkjet 180 dpi — £845
- Rendale 8802 Genlock ... — £159
- Rendale Super 8802 SVHS — £525
- Rendale Pro Genlock ... — £575
- ColorBurst 24-bit card — £569
- SuperPic Genlock/hi-res Digitiser — £495
- SketchMaster 18x12 dwg. tablet, 1000 lpi, with stylus & 4-button cursor — £495

■■■ A1500 with 50MB Quantum autoboot hard disk £1049!

TELETEXT AMIGA

Why not enjoy the free **Teletext** databases with the **MicroText** Teletext adaptor... Fully programmable, with **Fastext** facility, instant access to last 16 pages, double page view, **telesoftware** loader, auto-start/background operation... Pages can spoken, printed as ASCII or graphics, saved as ASCII or IFF files... And it turns your 1081/1084/8833 monitor into a digital TV! Available now for only **£144!**

■■■ Amstrad FX9600AT Fax + Printer + Copier + Scanner £115 off!

PRODUCTIVITY AMIGA

SAS/Lattice C v5.10A		£159.95
A/C Basic v1.3		109.95
A/C Fortran		179.95
APL 68000 Level II v7.30		299.95
Dos-2-Dos		34.95
Workbench 1.3 Enhancer		12.95
SuperPlan	Pro spreadsheet with business graphics, time planner	39.95
SuperBase Personal 2	Relational database power, without programming!	39.95
" " Professional 4	Much enhanced and with many new features	224.95
" " Professional 3	"The Rolls-Royce of Amiga databases" (NCE)	149.95
C64 Emulator v2	Don't throw your C64 software away!	49.95
Doctor Ami	Guru stopper... disables bad disk blocks and RAM!	34.95
Disk Mechanic	Tune-up, backup, salvage, plus new CLI commands	44.95
QuarterBack v4.3	The fastest hard disk backup utility	49.95
Quarterback Tools	Disk recovery and performance optimisation	59.95
Turbo Text	Extremely fast and powerful text editor from Oxxi	59.95
AmigaTex	Comprehensive typesetting package for perfect output	109.95
Excellence 2	New improved version... Word Perfect with graphics!	89.95
Pagestream 2.1	Many major new features incl. Agfa/Adobe fonts	139.95
Professional Page 2.0A	Now with WP, 24-bit & Pantone colours & more	169.95
CG Outline Fonts	35 Agfa CG fonts for ProPage, ProDraw 2, PageSetter 2	89.95
Professional Draw 2	Improved version with auto-trace, curved text & more...	89.95
Design Works	Fast and intuitive structured drawing	69.95
Pen Pal v1.3 Rev 18		£69.95
TransWrite Gold Disk		29.95
Works! Platinum Edition v1.10		59.95
Pagesetter 2		49.95
Professional Page Clip Art		34.95
Professional Page Templates		34.95

■■■ ALL PRICES INCLUDE DELIVERY AND 17½% VAT ■■■

CREATIVITY AMIGA

Digiview Gold v4.0 + DigiPaint		£89.95
Turbo Silver v3.0A		89.95
Imagine		189.95
De Luxe Video III		59.95
De Luxe Paint III		39.95
SpectraColor		54.95
Introcad Plus	Powerful new version of popular CAD program	69.95
Broadcast Titler 2	Real broadcast quality titling with 4-level anti-aliasing	169.95
BT2 Font Enhancer	Renders fonts to Broadcast Titler anti-aliased format	109.95
Broadcast Font Pack 1	10 professional quality fonts for Broadcast Titler	109.95
Pro Video Post	The ultimate in video presentation, titling & effects	169.95
Pro Video font sets	Choice of 5 sets of 4 anti-aliased fonts, per set...	89.95
TV-Text Professional v2	Latest full-feature video titler, includes Zuma fonts	79.95
TV-Show v2.02	Video presentation, special effects & transitions	54.95
Video Effects 3D v1.2a	Smooth playback, unlimited 3D effect combinations	129.95
The Art Department v1.0.2		£54.95
Art Department Professional		129.95
Digipaint 3		59.95
AmigaVision v1.53G		69.95

■■■ IF YOU WANT IT TOMORROW... CALL US TODAY! ON 081-546-7256 ■■■

Prices are POST FREE & include VAT. Order by phone with your credit card, or send cheque/PO or your credit card number. We welcome official orders. Software sent same-day by 1st Class post, but please allow five days for hardware delivery, unless overnight. Prices subject to availability. Ref. A80

Calco Software

LAKESIDE HOUSE, KINGSTON HILL, SURREY, KT2 7QT. TEL 081-546-7256

SOFT EXCHANGE

COME TO US FOR PRICE QUALITY AND SERVICE.
REMEMBER WE DO NOT SELL CHEAP INFERIOR QUALITY DISKS YOU CAN BUY THESE FROM OTHERS

	Panasonic Bulk 3.5 DS/DD	Sony Bulk 3.5 DS/DD	K.A.O. 3.5 Branded
10	£4.99	£5.99	£5.99
20	£8.49	£9.99	£10.99
30	£12.49	£14.49	£15.99
40	£15.49	£17.99	£19.99
50	£18.99	£21.99	£22.99
100	£33.99	£38.99	£42.99
200	£63.99	£75.99	£79.99
300	£94.99	£108.99	£114.99
400	£123.99	£139.99	£147.99
500	£154.99	£169.99	£179.99
1000	£289.99	£329.99	£349.99
2000	£574.99	£659.99	£689.99

Includes labels and lifetime guarantee

SPECIAL OFFERS

- 10 Disks + 100 cap box £10.99
- 20 Disks + 100 cap box £13.99
- 30 Disks + 100 cap box £18.49
- 40 Disks + 100 cap box £21.99
- 50 Disks + 100 cap box £24.99
- 100 Disks +100 cap box £39.99
- 200 Disks + 2 x 200 cap box £67.99

ACCESSORIES

- 40 cap box £5.99
- 80 cap box £6.99
- 100 cap box £7.99
- Banx stackable boxes £8.99
- Mouse mats £2.99
- Disk labels 50 ....£1.50
- Disk labels 100 ....£2.50
- Disk labels 200 ....£3.50
- Disk labels 500 ....£7.50
- Disk labels 1000 ....£13.99
- Disk head cleaner £2.99
- Dust cover (keyboard) £4.99
- Dust cover 12" monitor £5.99
- Dust cover 14" monitor £6.99
- Logitech 2 button mouse £23.99
- Wang 5.25" disks box of 10 ...£4.99

All prices include VAT, post and packing in UK. Overseas orders please write or telephone. To order please send a cheque/P.O made payable to

SOFT EXCHANGE, 101 CLIFTON ROAD, SOUTH NORWOOD, LONDON SE25 6QA. TEL 081 653 9094 (24 hours order line)

Access/Visa accepted. All above offers close 30.09.91 government and educational orders quoted at very competitive prices

DATAPLEX COMPUTERS LTD.

dataplex

129 Bath Road, Slough, Berkshire, SL1 3UW	19 High Street, Old Town, Swindon, Wilts
Tel: 0753 535557	Tel: 0793 488448

Access VISA

SHOWROOM open: Mon - Fri 9.30 - 5.30 Saturday 9.30 - 4.30
MAILORDER Consumables £1.50 Hardware £8.00 Prices excluding VAT

AMIGA A500 HARDWARE

- Amiga A500 Screen Gems + 1 Meg Pack £309
- Amiga A500 Screen Gems Pack + free disks + 10 extra games pack £345
- Amiga A500 1 Meg Class of 90's (First Steps) £369

CARTOON CLASSIC PACK

Amiga A500 including 1 Meg Ram + FREE 10 blank disks, mouse mat
£309
(Software includes Lemmings, The Simpsons v Space Mutant, Captain Planet, Deluxe Paint 3)

A1500 £549

- **A1500 Base plus software .£549.00**
- **A1500 + Philips CM8833 Mk2 Colour Monitor £725.00**
- **A1500 + Commodore 1084S Colour Monitor £735.00**

AMIGA/ATARI DRIVES

- 1 Meg 3.5" internal £49
- 1 Meg 3.5" external (Cumana) £60
- 1 Meg 5.25" external £90

ACCESSORIES

- 512K Ram + clock £30
- Joystick £10
- 10 Blank disks in library box £8
- Mouse Mat £3
- Amiga/Atari Mouse £29
- 1½ Meg Ram + Clock £99.00
- A500 Power Supply Unit £34.00
- Naksha Mouse plus Operation Stealth £24.00

INTRODUCTORY OFFER

Screen Filter for your monitors.
Protect those precious eyes **£15**
(Woven nylon fibre, flare reduction 90%, cuts ultra-violet reflection by 85%)

MONITORS

Philips CM8833 MK II Colour Monitor + FREE Lead £189

PRINTERS

- Star LC10 Mono £125
- Star LC200 Colour (9 pin) £169
- Star LC24 10 ....£160
- Star LC24 200 (24 pin) £205
- Star LC24 200 Colour £245
- Panasonic KXP1124i £214
- Panasonic KXP 1123 ....£158
- Panasonic KXP1624 ....£329
- Citizen 120D + ...£120
- Citizen Swift 24 + Colour Upgrade £239
- Citizen Swift 9 + Colour Upgrade £160
- Canon BJ 10E Inkjet £190
- HP Deskjet 500 + Leads £329
- Sheetfeeder £49

All above come complete with leads

AMIGA HARD DRIVES (PROTAR)

These hard drives come with a 1 year replacement warranty.

- 20Mb External £235.00
- 30Mb External £295.00
- 50Mb External £365.00
- 60Mb External £460.00
- 80Mb External £499.00
- 100Mb External £539.00
- 160Mb External £799.00

All disks come complete with software

Messing with DOS

Michael Lazarou looks at how to get the best out of MessyDOS, a utility for reading PC-formatted disks on your Amiga

Swapping information between computers can be tricky – especially when the two machines have completely incompatible disk formats. As a result of the enormous popularity of the IBM-compatible PC, almost all of the major home computers have the facility to read PC disks. Therefore if you need to transfer files between the Amiga, ST, Archimedes, Macintosh and of course the PC the chances are that you will be able to do so by putting the files on a PC-format disk.

Getting your Amiga to use PC disks is not that much of a problem, thanks to a set of programs in the public domain called the *MessyDOS File System Handler*, or *MSH* for short. *MSH* is written by Olaf Seibert, and persuades your Amiga to use IBM PC disks as though they were real Amiga disks. However, although *MessyDOS* is one of the most useful public domain programs that is available, it is unfortunately also one of the least user-friendly. The manual files which come along with the utility are so full of technical details that it is extremely difficult to find the basic information needed to make the thing work properly. I am a member of a world wide e-mail list called Info-Amiga and lately it has been full of people seeking help because they could not get *MessyDOS* to work correctly. Because there is clearly a problem with understanding the program, therefore, I wrote this simple tutorial on how to set up *MessyDOS* on your boot disk and how to use it to read and write to standard double-sided 80-track IBM PC disks.

WHERE TO GET IT?

Getting hold of *MessyDOS* should be no problem. Any half-decent PD library should stock it. Make sure that you get version 1.3 or higher, as early versions don't work very well. Some libraries may give you a copy of *MessyDOS* ready-installed on a Workbench disk, but you may have to install it yourself – if you download it from a bulletin board, for example.

INSTALLING MESSYDOS

Installing *MessyDOS* is quite simple and mainly involves the transfer of files on to your boot disk. Unfortunately the system does not come with an automatic installation script, so the files must be transferred manually by the user. First of all, copy the commands DIE, IGNORE and MESSYFMT to the 'C' directory. Then copy the device handler 'messydisk.device' to the 'DEVS' directory, and the file system handler 'MessyFileSytem' to the 'L' directory. You will also need 'arp.library' version 1.3 or above in the LIBS directory. The version of *MessyDOS* I received did not come with the arp.library on it, but the library is readily available and if you have collected any PD software at all then you probably have it on one of the PD disks already.

The only slightly tricky bit of installation is changing the mountlist in the DEVS directory. Below is a sample mountlist entry to turn unit 1 into a *MessyDOS* drive. Use any text editor to add it to your mountlist. For it to work you must use the Workbench 1.3 or above version of the MOUNT command. For Workbench 1.2, change 'FileSystem' to 'Handler'.

```
/*
* An example mountlist entry
* to turn unit 1 into an
* 80-track IBM drive
*/
   MS1:     FileSystem =      ↵
L:MessyFileSystem
   Device =                  ↵
DEVS:messydisk.device
   Unit = 1
   Flags = 0
   LowCyl = 0 ; HighCyl = 79
   Reserved = 0
   Surfaces = 2
   BlocksPerTrack = 9
   Buffers = 5
   DosType = 1
   BufMemType = 1
   BootPri = 0
   Stacksize = 3072
   Priority = 9
   GlobVec  = -1
   Mount = 1
   #
```

Please note that this example mountlist is for version 1.3 of *MessyDOS*; earlier versions use a slightly different mountlist, and you should see the accompanying manual files of your version for the relevant details.

The new device name is MS1: and can be used just as you would use DF1:. You don't have to use the name MS1: if you don't want to – any name you like will do. If you wish to use drive 0 instead of drive 1 then just change the unit number in the mountlist to 0. Unfortunately, the file system handler MessyFileSystem is not 'pure'. This means that if you wish to have two drives operating as *MessyDOS* drives then you really ought to have two copies of the MessyFileSystem: MessyFileSystem0 and MessyFileSystem1, for example. Although, I have run both drives 0 and 1 with the same file system with no problems, don't be surprised if the machine suddenly Gurus for no apparent reason if you do this.

USING THE SYSTEM

The system is now fully installed, but before you can use *MessyDOS* disks the device has to be mounted. You may prefer to add this to your Startup-sequence, so that the operation is performed automatically.

To mount *MessyDOS*, type the following at the CLI (or add it to your Startup-sequence):

```
> MOUNT MS1:
```

You can now use MS1: just like a normal drive. All the normal commands such as DIR, LIST, INFO and CD will work with the device, and you can create and read files just as though you were using an Amiga disk. In earlier versions of *MessyDOS*, DIR and LIST did not work properly – they thought that all files were directories – but this has been fixed in version 1.3. And just to make things even more confusing, the 1.3 Arp versions of LIST and DIR worked with earlier versions of *MessyDOS*.

continued on page 92

JARGON BUSTING

DOS – Short for Disk Operating System, DOS is the firmware which allows the Amiga to access disks.

IBM PC – The IBM PC and its clones form the most popular computer system in the world. If there's a computer in an office, the chances are that it's a PC-compatible machine. Although many places use true IBM machines, the vast majority use third-party imitations, known as 'clones'.

BEGINNERS START HERE

What is DOS, exactly?

DOS stands for Disk Operating System, and is a piece of firmware which allows a computer to access floppy and hard disks. Almost all computers have different DOSses, which means that it is quite difficult – and sometimes impossible – to take disks created on one computer and use them on another.

So what does* MessyDOS *do?

***MessyDOS* is a 'patch' which fools the Amiga into reading IBM PC-compatible disks. So any disk which was created on an IBM PC should be readable by the Amiga. But do remember that *MessyDOS* doesn't allow PC programs to run on the Amiga – it's only data files which will be transferrable. And even then, you'll have to have an Amiga program which is capable of understanding the data. Text files saved as plain ASCII, for instance, should be readable by just about any word processor, but data saved in a program's native file format is unlikely to be usable on the Amiga without a great deal of messing around.**

continued from page 91

FORMAT DIFFERENCES

There are a couple of differences between the *MessyDOS* file system and the AmigaDOS file system. The most obvious difference is in the naming of files. *MessyDOS* uses standard IBM filenames, which are an 8-character base name with a 3-character extension separated by a full-stop ('period'). There is also a restriction to the characters that you may use in filenames. Basically you are limited to the upper-case letters A-Z, digits 0-9, and most 'punctuation' characters except space * ? . < > / = | , : and \. If an illegal file name is passed to *MessyDOS* then it will try to map the name to one that is allowed. For example, lower-case letters are converted to upper-case. As only 3-character extensions are allowed, '.info' files are illegal *MessyDOS* file names. Filenotes are not allowed on *MessyDOS* disks either.

THE COMMANDS

DIE is used to unload *MessyDOS* when you no longer require it. This means that you can claim back about 30K of memory if you get short of RAM during a session. This is done by typing DIE <device> at the CLI. For example, DIE MS1: will free the space used by the code for MS1:. The device is still mounted, though, and MS1: can be accessed by a simple CD command. DIE should not be used if any program expects the device to be there. For example, killing MS1: while it is the current directory is not recommended. The author of the system does not recommend using DIE when Workbench is loaded.

You can format your own *MessyDOS* disks using the supplied command MESSYFMT. This program is daunting, to say the least, so you may prefer to use a PC to format your disks before you use them on your Amiga.

The usage of the command is:

```
messyfmt <unitnr> <device>
```

The <device> name is optional and defaults to 'messydisk.device'. For example, MESSYFMT MS1:

MESSYFMT now swamps you with a mass of questions to determine exactly how you want to format the disk. As long as you want a standard, double-sided 80-track IBM disk then you don't have to worry about most of them, as that is the default. Just keep pressing <Return> until asked whether you want to format the whole disk. Enter 1 and then enter 42 to show that you are still awake and know what you are doing. The disk will then be formatted. It is possible to just format the boot block and root directory – which performs a similar job to the AmigaDOS 'FORMAT QUICK' option, but for a PC disk.

This is the list of questions that MESSYFMT will ask you:

```
Bytes per sector? [512]
Sectors per track? [9]
Number of sides? [2]
Starting cylinder? [0]
Number of cylinders? [80]
Sectors per cluster? [2]
Bootsectors? [1]
Number of FAT copies? [2]
Root directory entries? [112]
Total number of sectors? ↲
[1440]
Media byte? [249]
Sectors per FAT? [3]
Number of hidden sectors? [0]
Format whole disk (enter ↲
1)? [0] 1
Are you sure? (enter 42)? ↲
[0] 42
```

The newly-formatted disk will have no name at this time, and will show up on Workbench as "Unnamed". The disk can be named using the standard AmigaDOS 'relabel' command. MESSYFMT can be used to create any IBM format that you will need. A single-sided disk can be formatted, for example, by changing the number of sides to 1. Don't forget to alter the mountlist to take account of any alterations, though.

IGNORE is a program which is supposed to suppress the CRC check in any currently open unit. It is used as:

```
ignore <unitnr> <YES/NO>
```

If you only give the unit number, IGNORE will output either Yes or No, reflecting whether CRC mismatches are currently being ignored. This command can be useful when you wish to recover data from a damaged or dodgy disk. Sometimes text files may be usable even if there are a few errors in them.

DUAL DRIVES

One of the strange things about *MessyDOS* is that it works in parallel to AmigaDOS. When a disk is inserted in a drive, the Amiga file system looks at it first to see whether it is a valid Amiga disk. If it says that it isn't then *MessyDOS* takes over and has a go. If the Amiga file system says yes then *MessyDOS* ignores the disk completely. This means that a drive can be two drives at once(!). You can access both DF1: and MS1: at the same time, for example. So by changing disks a couple of times when necessary you can keep your two Amiga drives and have a PC drive as well.

DOING THE BIZ

Overall, *MessyDOS* is a very solid system, by which I mean that it is not likely to 'Guru' just because you sneezed too hard – unlike a lot of PD software about. Most file requesters should allow you to access *MessyDOS* devices as legal drives; those using isup.library and req.library, for instance, will work with no problems. The system generally performs extremely well, although it is a bit slow and transferring large files can take quite a long time. Another thing to look out for is that when Workbench is loaded there are two icons for a *MessyDOS* disk instead of one. This is because both the Amiga system and *MessyDOS* give an icon to the disk. Because the Amiga file system does not understand the format, it gives the disk the name DF1:BAD.

Hopefully you should now be able to use the system with no problems. If you wish to contact me for more information, you can e-mail me on Internet as username michaell@cogs.susx.ac.uk. AS

WANTED!

Your honest opinion of *Amiga Shopper*

To help us keep improving your favourite magazine, please fill in and return this form each month. Photocopy it if you don't want to cut up your magazine.

1. How did you buy this issue?

- ☐ I subscribe
- ☐ Newsagent delivered it to my home
- ☐ Asked newsagent to reserve copy
- ☐ Bought it on a planned shop visit
- ☐ Just happened to see it and liked it

2. Rate *Amiga Shopper* in terms of value for money:

☐ Excellent ☐ Good
☐ Reasonable ☐ Poor ☐ Rip-off

3. Out of ten, how much did this month's cover make you want to look inside? /10

4. How much does this issue appeal to you overall? /10

5. How does it compare with previous issues you've seen?

☐ Much better ☐ Slightly better
☐ About the same standard ☐ Slightly worse
☐ Much worse

6. Rate out of ten this and any other computer magazines you read regularly:

Amiga Shopper................................/10
................................/10
................................/10
................................/10

7. Out of ten, how useful did you find this month's feature on 3D graphics? /10

8. What do you like most and then least about this issue?

I most like................................
....
....

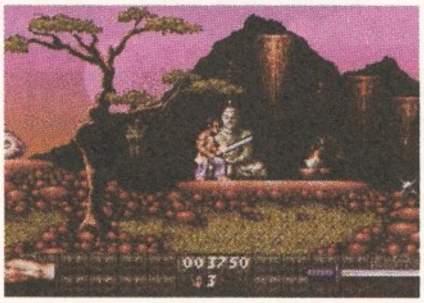
And I least like................................
....
....

Your name and address:*
....
....
....

* Leave blank if you wish – but we may want to send you details of exclusive special offers.

■ No stamp needed if posted in UK. Return to: ***Amiga Shopper* November Survey, Future Publishing, Freepost, Bath BA1 2XF**

Yeah, we play games but we take 'em seriously!



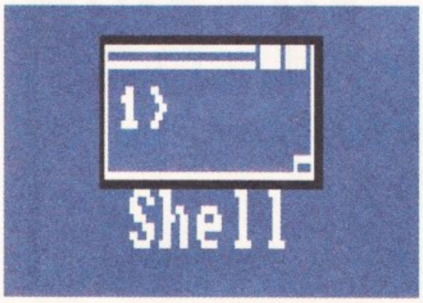
Want to know a secret?

We blow the lid on the tricks and techniques that are used to create into a game with top-class graphics

Make a hard decision!

We put A500 hard drives to the test and help you decide which to buy





Are you making the most of your machine?

Harness the hidden power of CLI with our new Beginners' series



Does it feel real?

Find out what the experts think of sims



Why are you STILL using a mouse?

How an alternative input device can improve your work

PLUS latest news of the Amiga scene (including an in-depth report on the upcoming World of Commodore show), the best reviews of everything that's new in games, serious software, hardware and PD software, and lashings of advice and help in our Workbench and Gamebusters sections.

Which is what makes Amiga Format the most exciting mix of everything for the Amiga, every month. Don't miss it!

SCHIZOPHRENIA UNLEASHED!

ISSUE 28 ON SALE THURSDAY OCTOBER 10TH £2.95

The world's best-selling Amiga magazine[1]

Britain's best-selling home computer magazine[1]

Reviews that the computer industry trusts the best[2]

1 ABC audited circulation 115,158 Jan-Jun 1991
2 Voted No 1 magazine aiding stocking decisions, Computer Trade Weekly Dealer Survey 1991

AMIGA FORMAT

Evesham Micros

PRICES INC.DELIVERY & VAT @ 17.5%

Express Courier Delivery :
(UK Mainland Only) £6.50 Extra

BUY WITH CONFIDENCE from one of the longest established companies in their field, with a reputation for good service and prices. We have invested heavily in a computer system to enable our Telesales staff to provide up-to-the-minute stock information, coupled with highly efficient order processing. Our fully equipped Workshop enables us to carry out almost any repair on our premises. We feel sure that you won't be disappointed if you choose Evesham Micros.

HOW TO ORDER....

Call us now on
0386 765500
Lines open Monday - Saturday, 9.00am - 5.30pm

Send Cheque, Postal Order or ACCESS/VISA card details to :

Evesham Micros Ltd
Unit 9, St Richards Rd.
Evesham, Worcs
WR11 6XJ

ACCESS / VISA Cards Welcome

Government, Education & PLC orders welcome
Same day despatch whenever possible
Express Courier delivery (UK Mainland only) £6.50 extra
Please note that 5 working days must be allowed for *personal cheque* clearance.

Mail Order Fax: 0386-765354

RETAIL SHOWROOMS

Unit 9 St Richards Road, Evesham
Worcestershire WR11 6XJ
☎ 0386 765180
fax : 0386 765354
Open Mon-Sat., 9.00 - 5.30

5 Glisson Rd, Cambridge CB1 2HA
☎ 0223 323898
fax : 0223 322883
Open Mon-Fri, 9.30-6.00 & Sat, 9.30-5.30
Corporate Sales Dept. ● *IBM dealer*

PLEASE NOTE THE CHANGE OF ADDRESS OF OUR BIRMINGHAM SHOWROOM FROM 4th NOVEMBER
251-255 MOSELEY ROAD, HIGHGATE, BIRMINGHAM B12 0EA
☎ 021 458 4564
fax : 021 433 3825
Open Mon-Sat., 9.00-5.30 • *Easy Parking*

TECHNICAL SUPPORT ☎ 0386-40303
Monday to Friday, 10.00 - 5.30

12 MONTHS WARRANTY ON ALL PRODUCTS

All details correct at time of going to press • All goods subject to availability

3½" Track Display Drive

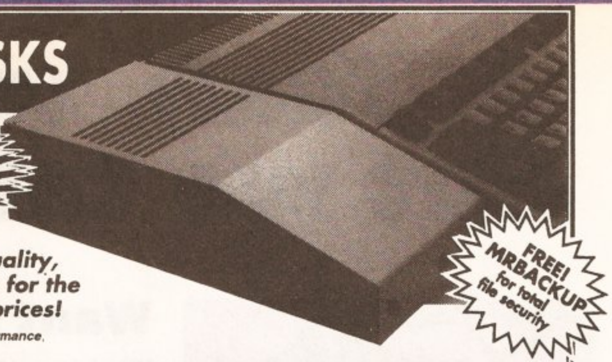


High quality double-sided 3.5" floppy drive offering the full 880K formatted capacity per 3.5" disk. Features a special LED display which accurately shows the current track being accessed during any disk drive activity. *NEW LOW PRICE!*

ONLY £64.95

A500 HARD DISKS

PRICE BREAKTHROUGH!



FREE! MRBACKUP for total file security

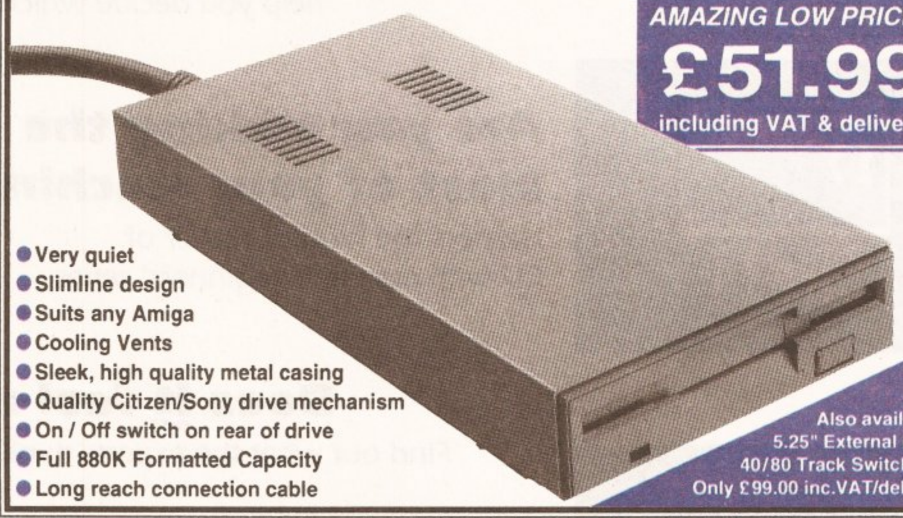
AT LAST... the chance to buy Quality, High Capacity Hard Disk Systems for the Amiga 500 at realistically low prices!

- ☆ **NEC SCSI HARD DISK MECHANISMS** for *optimum performance*, 25ms Access Time & Autoparking
- ☆ **Includes its own DEDICATED PSU**. CBM recommends against use of Hard Disks without independent power supply.
- ☆ **QUIET**.... latest technology drives run cool; no fan is needed!
- ☆ Option for **up to 4MB additional easy RAM EXPANSION**, using **'SIMMS'**
- ☆ **GAME SWITCH** allows Games to be loaded without disconnection
- ☆ Includes **SCSI THROUGHPORT** at rear for further expansion
- ☆ **High quality** metal casing, colour matched to the Amiga 500
- ☆ **Includes 'MRBACKUP PRO'** as well as Configuration/Format software

40Mb MODEL ONLY £299
100Mb MODEL ONLY £449
2Mb RAM Version: ADD £80 • 4Mb RAM Version: ADD £160

3½" EXTERNAL FLOPPY DRIVES

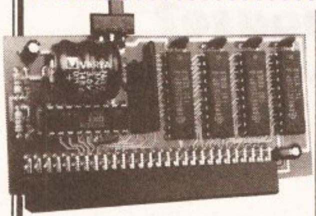
AMAZING LOW PRICE !
£51.99
including VAT & delivery



- Very quiet
- Slimline design
- Suits any Amiga
- Cooling Vents
- Sleek, high quality metal casing
- Quality Citizen/Sony drive mechanism
- On / Off switch on rear of drive
- Full 880K Formatted Capacity
- Long reach connection cable

Also available :
5.25" External Drive
40/80 Track Switchable
Only £99.00 inc.VAT/delivery

AMIGA A500 SOLDERLESS RAM UPGRADES



512K RAM/CLOCK UPGRADE

ONLY £28.99 inc. VAT and delivery

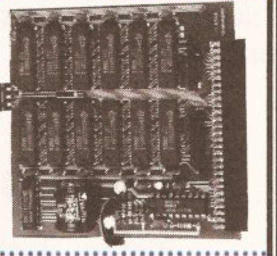
512K RAM Expansion also available without clock for only :
£24.99

☆ Direct replacement for the A501 expansion ☆ Convenient On / Off Memory Switch ☆ Auto-recharging battery backed Real-Time Clock ☆ Compact Unit Size : Ultra-neat design ☆ Only 4 low power FASTRAMs

1.5MB RAM BOARD

UPGRADE TO 2MB FOR ONLY £79 !

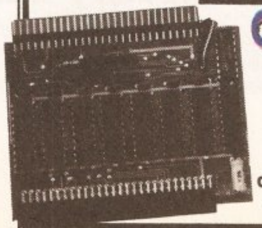
Fully populated board increases total RAM in A500 to 2Mb ! ☆ Plugs into trapdoor area, & connects to 'GARY' chip ☆ Includes battery-backed real-time Clock ☆ Socketed RAM ICs on 512K / 1Mb Versions



Unpopulated RAM board with clock	£ 34.95
RAM Board with 512K FASTRAM installed	£ 54.95
RAM Board with 1Mb FASTRAM installed	£ 69.95
RAM Board with 1.5Mb FASTRAM installed	£ 79.00

N.B.: The expansion board requires Kickstart 1.3 to operate - Kickstart 1.3 upgrade available from us for £29.95

NEW! 'MEGABOARD'



Connects to your 512K RAM upgrade to give 1.5MB

With our MEGABOARD, you can further expand your A500's memory to a total of 2Mb without disposing of your existing 512K upgrade (must be 4 x RAM-chip type, or not exceeding 9cm in length).

ONLY £59.95

MEGABOARD needs Kickstart 1.3 to operate (Kickstart 1.3 upgrade available from us for £29.95). Installation requires connection to the GARY chip. Easy to follow instructions provided.

ZY-FI amplified stereo speakers

REALISE THE TRUE SOUND POTENTIAL OF YOUR AMIGA WITH THIS PAIR OF FULL RANGE SPEAKERS !



Your Amiga produces fine quality hi-fi stereo sound. Enjoy quality stereo sound reproduction *to the full* with this specially designed, great new twin speaker system! Features reflex ported speaker design with 3 separate drivers in each unit, and incorporates a built-in amplifier with adjustable volume control. Runs from PSU (supplied) or from batteries (not included).
Speaker Dimensions 248x93x125mm (HxWxD)

ONLY £39.95

NEW! TOP VALUE 400dpi HANDY SCANNER

QUALITY SCANNING - AT THE RIGHT PRICE !



Representing outstanding value for money, this package combines *top quality* scanning hardware with the distinctively powerful *DAATASCAN PROFESSIONAL* software.

At a genuine 400dpi scanning resolution, this new scanner produces truly superb quality scans. Has a full 105mm scanning width, variable brightness control and 100 / 200 / 300 / 400dpi resolution. **Daatascan Professional** scanning *and* editing software allows real-time scanning in either line art or in up to 64 simulated grey scales. Provides powerful editing features and

ONLY £119.99

GOLDEN IMAGE HANDY SCANNER & TOUCH-UP

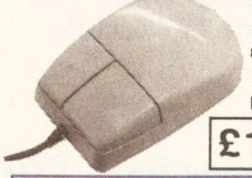


LIMITED OFFER!! INCLUDES FREE 'DELUXE PAINT 2'

Outstanding quality, excellent value for money - this package includes a 100-400dpi scanner with dither options, plus the amazingly powerful TOUCH-UP software package which drives the scanner directly. Scanner includes viewing window & backlight for accurate scans every time. Scan either line-art or grey images up to 400dpi. Many image enhancement & special effects available from within Touch-Up. A sensible investment for Desktop Publishing work.

ONLY £145.00

TRUEMOUSE



WE GUARANTEE that this is the smoothest, most responsive and accurate replacement mouse you can buy for the Amiga. Excellent performance, amazing low price !

£17.95 *SATISFACTION GUARANTEED*

GOLDEN IMAGE OPTICAL MOUSE Amiga/ST compatible - excellent travel+accuracy assured. **NEW LOW PRICE!** . £ 29.00

ROCGEN GENLOCK



YOU WILL HAVE TO PAY *AT LEAST* TWICE AS MUCH MONEY to obtain a similar level of quality, function and sophistication offered by our new GENLOCK adapter, compatible to all Amigas! Special features include the ability to record graphics & animations on video recorders and overlay graphic and text onto video. Capable of smooth and stable fading and overlaying effects with special tuning knob.

ONLY £114.99

PHILIPS 15" TV/MONITOR



With its dedicated monitor input, this model combines the advantages of a high quality medium resolution colour monitor with the convenience of remote control Teletext TV - at an excellent low price ! NEW Version features dark glass screen for improved contrast, plus full range 3-way speaker sound output .

£269.00 Including VAT, delivery & cable

Philips CM8833 Mk.II including cable .... £ 239.00

A590 ADD-ON HARD DRIVES

A590 OWNERS! Expand your hard disk storage further with one of our add-on, externally cased SCSI Hard Drives, with 25ms autoparking NEC mechanisms and separate power supply. Plugs into the socket provided on the rear of the A590 unit.

External 40Mb SCSI Drive cased with PSU to directly add-on to the Commodore A590 .... £ 299.00
External 100Mb SCSI Drive cased with PSU .... £ 449.00

AMIGA SPECIAL DEALS

A500 CARTOON CLASSICS PACK

INCLUDES 3 BRILLIANT CHART-TOPPING GAMES !!!



Top Value Starter Pack includes :
- Amiga 500 with 1Mb RAM and 1Mb Drive
- TV Modulator, Mouse, Kickstart 1.3, etc.
- 'DELUXE PAINT III' Paint Package, PLUS:

'LEMMINGS' *(top seller!)*
'CAPTAIN PLANET'
'BART SIMPSON vs. THE SPACE MUTANTS'

£369.99
AVAILABLE WITH 2ND 3.5" EXTERNAL DRIVE FOR A SPECIAL PRICE OF £419.99

'CARTOON CLASSICS EXTRA' PACK

GAZZA transfers to Evesham Micros with our new brilliant value Classics Extra Pack!

Features an Amiga 500 '*Cartoon Classics*' Pack as detailed above, plus these Fabulous games :

'GAZZA 2'

'NIGEL MANSELL'	'JUNGLE BOOK'	'SUBBUTEO'
'Tracksuit Manager 90'	'ASTERIX'	'Tank Battle'
'Battle Squadron'	'Diet Riot'	'Block Alanche'
'Treasure Trap'	'Lost'N'Maze'	'DiskMan'

PLUS! A wordprocessor and spreadsheet

£389.99
AVAILABLE WITH 2ND 3.5" EXTERNAL DRIVE FOR A SPECIAL PRICE OF £439.99

A500 Class of the 90's Pack ....£ 499.00
A500 Class of the 90's Pack *plus* our 3.5" External Disk Drive ....£ 549.00
Amiga 1500 Starter Pack.(1Mb RAM, 2x3.5" drives, Colr.Monitor etc ...£ 949.00
Commodore A590 20Mb Hard Drive...£ 299.99
A590 512K RAM Upgrade......................£ 29.95
A590 1Mb RAM Upgrade........................£ 59.95
A590 2Mb RAM Upgrade........................£ 99.95

AMIGA 1500/2000 UPGRADES

HARD DRIVE / RAM UPGRADE BOARD KIT

Kits comprise of full size hard disk controller cards incorporating unpopulated SIMMS RAM expansion sockets for accommodating up to 8Mb RAM; PLUS high speed, fast access NEC SCSI hard disks.

40MB HARD DRIVE & INTERFACE / RAM CARD.... £ 349.00
100MB HARD DRIVE & INTERFACE / RAM CARD.. £ 499.00

PLEASE NOTE: These are unpopulated RAM sockets - Add £80.00 per 2Mb of RAM required.

8Mb RAM Expansion Card with 2Mb Fitted
easily upgradeable to 4Mb, 6Mb or 8Mb .... £ 149.95

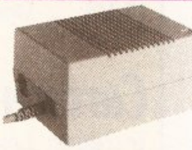
VIRUS PROTECTOR

BANISH VIRUS PROBLEMS!

Our compact Virus Protector fits easily to the Port of the last disk drive in your Amiga system, protecting all internal and external drives from boot block viruses. Incorporates a switch to enable or disable the protection facility.

ONLY £6.95

REPLACEMENT A500 PSU



Genuine Commodore Amiga A500 type replacement Power Supply Unit. Good quality 'switch mode' type. Super low price!

ONLY £39.95

MIDI INTERFACE

Our fully compatible, high quality MIDI interface connects directly with the Amiga serial port and provides IN, OUT & THRU ports for good flexibility. Features LED indicators on each port for diagnostic purposes. Superb compact design.

ONLY £19.95

STEREO SOUND SAMPLER

Offering full compatibility with almost any Amiga audio digitiser package, our Sound Sampler features excellent circuitry, yielding professional results. The main A/D converter gives a digitising resolution of up to 50KHz, with a fast slew rate. Two phono sockets are provided for stereo line input, plus an option for microphone. Adjustable gain is achieved with built-in control knob. Complete with public domain disk containing sound sampling applications / utilities.

ONLY £29.95

AMIGA 500 INTERNAL 3.5" REPLACEMENT DRIVE

Fully compatible. Kit includes full fitting instructions ...... £ 41.99

NEW! **COMMODORE C.D.T.V. Including 'Lemmings' & 'Hutchinsons Encyclopaedia' Starter Compact Disks** ....£ 579.00
VIDI-Amiga video digitiser package inc. VIDI-Chrome........................ £ 110.00
VIDI-Chrome Amiga colour frame generation kit from B&W images. £ 16.95
VIDI-RGB colour frame generation kit from B&W images .... £ 64.95
EMR VIDEOPILOT V320 Sophisticated Video Editing System .... £ 989.00
KCS Powerboard Hardware PC Emulator with its own 1Mb of RAM on-board, 512K useable in Amiga mode .... £ 229.99
Kickstart 1.3 Upgrade .... £ 29.95
Amiga 500 Dust Cover .... £ 4.95

SOFTWARE

Digita Wordworth	£ 119.00
Kind Words 2	£ 37.95
Protext V5	£ 119.95
Digita Home Accounts	£ 23.95
Deluxe Paint 4	£ POA
Deluxe Video 3	£ 84.95
Music-X 1.1	£ 65.00
AMOS	£ 37.50
HiSoft Lattice C	£ 199.00
GFA BASIC V3	£ 39.95
GFA BASIC Compiler	£ 34.95
Devpac 2.15	£ 44.95
Disney Animation Studio	£ 69.95

NEW! STAR LC20 9-Pin Printer

NEW SUCCESSOR TO THE STAR LC-10, WITH MANY FEATURES AND A FASTER PRINT SPEED

Providing superlative paper handling, four excellent NLQ fonts and a new super-fast print speed of 180cps in draft and 44 cps in NLQ, the LC20 appropriately supercedes the phenomenally successful LC10 !

INCLUDES CONNECTION CABLE & 12 MONTHS ON-SITE MAINTENANCE!

ONLY £139.99

PRINTERS

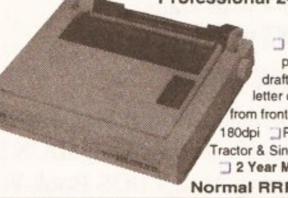
Prices include VAT, delivery and cable

EVESHAM MICROS SPECIAL OFFER !
All STAR Printers include 12 months On-Site Maintenance

Star LC 200 9-Pin Colour, 4 fonts. 180/45cps	£ 209.00
NEW! STAR LC20 fast 180/45cps super 9-pin. excellent value	£ 139.99
Star LC 24-10 24-Pin. 4 fonts. 180/60cps	£ 209.00
Star LC 24-200 24-Pin. 5 fonts. 200/67cps	£ 249.00
Star LC 24-200C 7 colour version of above	£ 289.00
Automatic Sheet Feeder for above printers (pls.state model)	£ 64.95
NEW! Star XB24-200 COLOUR 24-pin. 80 col. power printer	£ 399.99
NEW! Star XB24-250 132 column version of XB24-200	£ 479.99
Olivetti JP-150 Inkjet *first class* quality - exceptional value	£ 269.99
Olivetti JP-350 Inkjet excellent high speed 300dpi printer	£ 389.99
Panasonic KXP1124i super-fast 24pin : 300 / 40cps	£ 279.00

Citizen PRODOT-24 COLOUR

Professional 24-Pin Colour Printer - at a budget price!



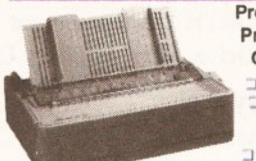
- Highly versatile letter quality printer
- 200 cps output in draft, 66 cps in LQ mode (5 true letter quality fonts)
- Full control from front panel
- Graphics res.360 x 180dpi
- Farallel and Serial Interfaces, Tractor & Single Sheet Feed as standard
- **2 Year Manufacturers Warranty**

Normal RRP: £ 746.35 inc.VAT

ONLY £269.00 including VAT, delivery and cable

Olivetti DM124C COLOUR

Professional 24-Pin Colour Printer with full 12 Months On-Site Warranty Cover !



- 200 cps in draft, 50 cps in LQ mode
- 7 Colour output: Graphics res. 360 x 180dpi
- Huge 40k buffer
- Tractor & Single Sheet Feed
- 12 MONTHS ON-SITE WARRANTY

DM124C Normal RRP: £ 389.95 inc.VAT

ONLY £269.00 including VAT, delivery and cable

TRACKBALL



Excellent new high performance trackball, directly compatible to any Amiga or Atari ST. Operates from the mouse or joystick port. Super-smooth, accurate and versatile - you probably won't want to use a mouse again after using this Trackball ! Total one-handed control. Top quality construction and opto-mechanical design, delivering high speed and accuracy every time. No driver software needed !

ONLY £29.95

Code à la mode

We present a new series which looks at the different languages available for the Amiga. In this article, we investigate Modula 2

Once upon a time, there was an unmanned American space probe making its way to Venus. During its journey, a course correction was required which involved the execution of a previously unused segment of Fortran code. This segment involved a line which was supposed to set up an iterative loop to be executed three times. It looked like this:

```
DO 3 I=1.3
```

Unfortunately, there is a full stop missing after the keyword DO, so instead of initiating a loop the program created a variable called DO3I and set it to a value of 1.3. The probe was never heard from again.

This sort of thing would never happen with Modula 2, a language which NASA is currently considering for use in its future endeavours.

Modula 2 was designed and written by Niklaus Wirth as a successor to Pascal, another of his creations. It is a very powerful language, similar in many ways to C – although if you were to compare listings of the same program written in both Modula 2 and C you might find this last statement surprising. They look quite different, but they are functionally very similar: there are few things that can be done with one language which can't be done with the other.

The main difference between the two is that Modula 2 is stricter language. Since one of Wirth's design goals was to create a language which would help students to learn how to program, Modula 2 discourages bad programming design. Programmers are forced to write in a far more structured way using Modula 2; the option is always open to a C programmer to write his or her code in an unreadable, highly unstructured way. Of course, whether programmers should be given this option is debatable.

IMPRESSIVE STRUCTURES

So, Modula 2 encourages 'structured programming', a phrase which will be familiar to those who have had the misfortune to take any kind of course in programming. But what is it? Basically, it is a set of rules which certain academics believe programmers ought to follow in order to produce program code which works correctly and which can be understood and modified easily at a later date.

There are a lot of good ideas in structured programming. For example, the need to declare all variables before use. What this means is that before the program proper, all variables to be used must be explicitly named, along with the type of value that they are to hold (integer, character and so on). Any variables used by the program which are not declared will cause an error at compile time. This is handy for picking up typing errors in a variable name, or the sort of errors which loose spaceships.

Perhaps the most important tenet of structured programming is that programs should be broken down into separate chunks. This is analogous to the use of subroutines in Basic, but languages such as Modula 2 and C provide more sophisticated ways of doing this by means of 'Procedure' and 'Function' structures. Modula 2 goes one stage further, with the introduction of modules (surprise, surprise).

COMMAND MODULES

A module is an independent section of code, compiled on its own. There are two main types: program modules and implementation modules. Each program consists of only one program module, but may make reference to procedures in any number of implementation modules. These provide a way of creating libraries: the actual code in such a module is completely hidden from the outside world, and all that a program knows is the names of the procedures and functions inside the module, the parameters these require, and any special variable types declared within the module. This information is made available to the program module by means of a corresponding definition module, roughly equivalent to the FD files on the Amiga Extras disk which provide interface information for the Amiga's system libraries.

The advantage of this is that once an implementation module has been written and debugged, it can be left well alone. If a bug arises in the calling program, it will not affect the code inside the implementation module, which can safely be assumed to be working. Another advantage is that general purpose implementation modules can be re-used with different programs, saving programmers from continuously re-inventing the wheel.

PROGRAM LAYOUT

So what does a Modula 2 program consist of, exactly?

Program modules begin with the keyword MODULE, followed by the module's name and a semi-colon.

After this comes a series of IMPORT statements. What these do is extract routines from the afore-mentioned definition and implementation modules. Just about any Modula 2 program will have IMPORT statements in it because, like C, the language itself is very sparse, without routines to perform even rudimentary input and output or string handling. Such things are handled by pre-written library routines, as they are in C.

The next step is the declaration of variables and constants. Constants are simply a way of using a word to represent a value which will not vary. Giving constants names can greatly add to the readability and maintainability of a program.

Modula 2 supports a variety of variable types, including integer, cardinal (unsigned integer), character, floating point and Boolean (with values of TRUE or FALSE). Variables declared in this part of the program are visible to the entire program – any part of the program can read and alter their values.

String variables are created by declaring them as arrays of characters, as they are in C. A consequence of this is that, unlike Basic, any given string variable has a maximum length decided by the programmer, and even if the string is shorter than its maximum, it still takes up the full amount of space.

Modula 2 also allows the creation of structured variable types – a collection of simpler types joined in a particular manner and given a user-specified name.

Modula 2, unlike C or Basic, is very fussy about types, and will not allow them to be mixed in expressions or assignments. For instance, an attempt to give a floating point variable an integer value will cause an error, whereas Basic or C will assume that a conversion is required and will perform it implicitly – something which is frowned upon by structured programmers. To get around this, since it is often necessary to convert from one type to another, Modula 2 allows type conversion by a process called casting.



"You don't just have to stick with C or Basic, you know – there are loads of other languages available."
Cliff Ramshaw

THE NEXT PROCEDURE

Once variable declaration is out of the way, the next step is the definition of any procedures local to the module (remember that external procedures can also be used). There are really two types of procedure: the normal type, which simply carries out a set of instructions and then returns control to the calling section of code; and the function type, which actually returns a value to the calling code.

Procedures in Modula 2 have an optional parameter list, which describes the number and types of variables to be passed to the procedure. Their names need not be the same as the names of the variables used in the calling statement. A procedure is called by its name and a list of parameters to be passed to it enclosed in brackets. As with C (and some Basics) two classes of parameters may be used: value and variable.

Value parameters are the default. When one is passed to a procedure, a copy is made of it and all work done by the procedure on it is actually done on the copy. When the procedure is finished, the copy is

continued on page 98

continued from page 97

destroyed, leaving the original parameter untouched. Use of value parameters is considered good style, since it means that the procedure is incapable of messing around with any variables that it should leave alone. It also means that the language supports recursion.

Sometimes it is necessary for the procedure to alter its parameters and for these alterations to be made known to the overall program. In this case, variable parameters are used (prefixed by VAR in the procedure declaration). When a variable parameter is used by a procedure, what is actually passed is a reference to the parameter in the calling statement. All operations on the parameter within the procedure are performed on the original variable, by means of this indirect reference. This is the same as, in C, passing a pointer to a procedure.

In the procedure body, as with the overall module, any variables needed are declared. These are local to that procedure – they cannot be accessed by the calling program, although they can be accessed by any procedures defined inside the procedure in which the variables are declared (if you see what I mean!).

After this comes the main code, describing what the procedure actually does, rounded off with an END statement.

If the procedure is a function, then it will include a RETURN statement, followed by the expression it is to return (an expression may be a simple value, a variable, or a combination of values and variables). Also, at the end of the initial PROCEDURE statement, after the parameter list, the type (integer, real, or whatever) of the returned value will be declared. Once all of the procedures have been defined, it is time to get on with the body of the program. In Modula 2, this is often quite short – consisting mainly of calls to the other procedures and sections of linking code. It begins with a BEGIN keyword (as does the code within a procedure), and ends with an END.

In fact, most control structures are delimited by the END keyword. A conditional statement consists of IF, followed by the condition and THEN. Between the THEN and END come all the statements to be executed if the condition evaluates to true.

A similar construct is expressed with the DO ... END keywords. This is used with both the WHILE statement, in which a condition is expressed and the following statements executed in a loop until the condition becomes false, and the FOR loop, in which the following statements are executed in a loop for the number of times specified within the FOR statement itself.

For an example of Modula 2 code, and a brief explanation, see the panel below.

WHAT USE?

So what can Modula 2 be used for? Well, anything that Pascal might be used for since, aside from a few syntactical differences, the language is essentially a superset of Pascal. C, however, is its main competitor. Like C, Modula 2 supports structured data types and has facilities for easy access to the individual elements of such types; it also has ADDRESS and BYTE data types, and allows hexadecimal values and assembler statements to be placed directly in the code. As such, it is a language suited to systems programming and speed-intensive applications.

It lacks a few of the subtleties of C, such as the facility to increment or decrement a variable while it is being used in an expression, but these things can be accomplished with a few lines of code. Basically, Modula 2 is a more verbose language, and one which is more careful to make you follow the rules. The uses to which it can be put are the same as C, and it is on its speed that it must stand or fall.

It is a fast language, no doubt about it. The problem is that, because it has not gained the popularity of C, not as much work has gone into developing compilers for it, and so they tend to produce slower, less efficient code. Having said that, its speed is perfectly adequate for most purposes, although you certainly won't be able to write the next arcade smash with it. Then again, you would be foolish to try that in C.

There are now two or three Modula 2 packages available for the Amiga. The one we tried out is *M2Amiga*, by A+L AG Meier-Vogt, a Swiss company. It comes on two disks, and will conceivably run on an unexpanded Amiga with two disk drives, although extra memory and a hard drive will help enormously.

The compiler itself is a single-pass affair, meaning it only has to look through the source code once before producing its output object code. It is therefore fast. The package also includes a set of standard Modula 2 libraries and a set of libraries providing interfaces to all of the Amiga's own libraries. A linker is supplied but, like most Modula 2 linkers, it is grossly inefficient. If, for example, a program makes use of the WriteString routine in the InOut module (Modula 2's standard input/output library), the whole of the InOut module is linked with the object code, along with all of the unused routines, adding an unnecessary 3K to the length of the finished code.

A number of demo programs are included in the package, which show how Modula 2 can be used to interface to the Amiga's graphics and other libraries.

The accompanying manual is slim but adequate. It makes no attempt to teach or even describe Modula 2 in detail – a reference book is needed for that. It briefly lists the interfaces to the Modula 2 and Amiga libraries, but again, the Amiga reference manuals will be required before any serious Amiga programming is attempted.

Modula 2 is a powerful and tidy language. As well as being of interest to the serious programmer, it could be of use to someone wanting to make the move from Basic to a structured language, or even to someone wishing to learn how to program from scratch. AS

A SAMPLE MODULA 2 PROGRAM

Calculating the prime numbers between 1 and a given value is one of the simplest, non-trivial computer problems, and can be elegantly expressed in Modula 2:

```
MODULE primes;
FROM InOut IMPORT
WriteString,WriteLn,WriteCard,ReadCard;
VAR count,current,final,test: CARDINAL;
BEGIN
 WriteString('Enter maximum value you wish ↵
to check ');
 ReadCard(final);
 WriteLn();
 FOR current:=1 TO final DO
  test:=2;
  WHILE (test<current DIV 2) AND ((current ↵
DIV test)*test # current) DO
    test:=test+1;
  END;
  IF ((current DIV test)*test#current) THEN
   WriteCard(current,5);
   WriteLn();
  END;
 END;
END primes.
```

The first line gives the name of the module, which must be the same as the filename. The FROM ... IMPORT statement gets a few necessary routines from the InOut library. After that come the variable declarations; all are of type CARDINAL, which is to say they are all positive integers.

There are no procedures, so we go straight on with the program proper, denoted by the BEGIN statement. WriteString, ReadCard and WriteLn are three of the InOut routines; the parameters to be passed are enclosed in brackets. Note that although WriteLn requires no parameters, it must still be called with empty brackets. ReadCard reads user input from the console and puts it into the CARDINAL parameter.

Next comes the FOR loop, which has much the same syntax as in Basic. Assignments in Modula 2 are done with the ':=' symbol, to differentiate them from comparisons of equality.

The WHILE loop tests the two conditions, and continues incrementing the variable 'test' until either of the conditions proves false. Once this loop has been exited, we know that either 'current' is exactly divisible by 'test', or that 'test' is greater than or equal to half the value of 'current' (in which case there is no need for further tests).

Program flow continues beyond the END statement, coming to the IF statement, which again tests if 'current' is exactly divisible by 'test'. If it is not, then current is a prime number and it is printed out. The InOut procedure WriteCard requires two parameters; the first is the CARDINAL to be output, the second is the number of characters to be printed.

The conditional is terminated with an END statement, as is the FOR loop. Finally, the module itself is terminated with another END statement, this time including the module's name and a full stop.

SHOPPING LIST

A+L M2Amiga........................£125

Available from Real Time Associates
Canning House
59 Canning Road
Croydon
Surrey
CR0 6QF
☎ 081-656 7333

YOU MUST BE CRAZY

NOT TO BUY YOUR DISKS AT THESE PRICES EVERY

DISKETTE 100% CERTIFIED 100% ERROR FREE

DISKETTES

50 DSDD 3.5" £24.00	200 DSDD 3.5" £64.00
100 DSDD 3.5" £36.00	500 DSDD 3.5" £155.00

3.5" High Density	5.25 DSDD	5.25HD
55p each	Only 25p each	Only 40p each

STAR OFFER

200 DSDD 3.5" **£72 .00**

Plus 2

100 capacity boxes

ACCESSORIES

50 capacity lockable box 3.5"....£3.95	Mouse mats..................................£2.95
80 capacity lockable box 3.5"....£4.50	3.5" head cleaner.......................£2.95
100 capacity lockable box 3.5"..£5.50	ONLY IF BOUGHT WITH DISKS
Banx Stackable box £8.95	

TOTAL SATISFACTION OR MONEY BACK

ALL PRICES INCLUDE VAT & DELIVERY

081-309-5556

DIAL A DISC

6 Walsingham Road, St Pauls Cray, Kent BR5 3BW

Personal callers by arrangement.

Access **All offers subject to availability E/OE.** VISA

---

ark

Access **Switchable voice/fax line** **0983 79496** **Open 10am-7pm Monday to Saturday** VISA

ACCOUNTS
- Arena Integrated Ac. 122.67
- Cashbook Combination...49.82
- EasyLedgers 153.46
- Home Accounts................24.44
- Personal Finance Mgr......25.85
- SBA Xtra 81.78
- Service industry Acc.......306.68
- System 3 Integrated.........39.95

BOOKS 34 Lines Stocked
- 68000 Asm Lan Prgrmg ..21.95
- Assembly Lang Prgrmg...14.95
- Amiga Basic In/Out 18.95
- Amiga C Beginners 18.45
- AmigaDOS 2 Companion..22.95
- Desktop Video Guide 18.45
- Disk Drives In/Out 27.95
- Amiga For Beginners 12.95
- System Progrms Guide ...32.95
- AmigaDOS Inside & Out .18.45
- Hardware Ref Manual 21.95
- Incs & Docs; ROM Mnl....28.95
- Kids And The Amiga 14.95
- Libs & Devs; ROM Mnl....29.95
- Mapping the Amiga 20.95

CABLES 100 Lines Stocked
- D23S-D15P NEC MS 3D 14.10
- D25P-D25P 25W 2M.......13.16
- D25P-C36P 2M Printer 6.58
- D25P-D25P 9W 2M Mod.11.28
- DIN5P-DIN5P MIDI 5.17
- Null Modem Cable...........12.22
- Gender Changers..............7.99
- Fast File Transfer 35.72
- Socket D23S & Hood 5.17
- Switch Box D25S x 2.......25.38

COMPUTER AIDED DESIGN
- 3D Construction Kit 44.65
- Draw 4D ....Query
- Professional Draw 2 ....99.64
- X CAD Designer...............79.90

DATABASE MANAGERS
- Image Finder (HotKey)....49.82
- InfoFile 46.06
- Mailshot Plus...................39.01
- Prodata............................55.93
- Superbase Personal.........27.73
- Superbase Personal 2......59.69
- Superbase Pro 3 ....159.80
- Superbase Pro 4 ....249.57
- Weather Watcher 25.38

DESKTOP PUBLISHING
- AmigaTex.......................111.39
- Clip Art PD 15 Disks........29.61
- GDType; Video HD...........32.90
- GDType; Designer HD 32.90
- GDType; Publisher HD.....32.90
- GDType; Decor HD 32.90
- Outline Fonts...................99.64
- PageSetter 2 ....47.00
- Pagestream 2.1 ....139.59
- Pro Clips Str. Art...............23.97
- Pro Page 2 2Mb 179.54
- Saxon Publisher 219.96
- Saxon Script.....................94.94
- Structured Clip Art............32.54

DUST COVERS (Deluxe Buff)
- Monitors 1084S/8833.........9.87
- Amiga 500 ....7.99

EDUCATION
- Distant Suns.....................51.23
- Fun School 3 (<5) 18.33
- Mega Maths A Level 24.44
- Micro English (GCSE).....23.97
- Micro French (GCSE)......23.97
- Micro Maths (GCSE) 23.97
- My Paint 24.91
- Primary Maths 24.44

EDITORS
- CygnusEd Pro 2..............61.10

GRAPHICS
- Animation Studio 84.60
- C Light Ray Tracing 29.61
- Deluxe Photolab...............56.40
- Deluxe Print 2...................37.60
- Deluxe Paint 3..................49.82
- Deluxe Paint 4 (2709) 74.73
- Digi Paint 3.......................54.05
- FantaVision 35.72
- Imagine 3D Modelling ...179.54
- Pixmate 39.95
- Real 3D Beginners 1.3 ..119.85
- Real 3D Turbo 2Mb.......329.94
- Scene Generator.............35.72
- Sculpt 3D XL 99.64
- Sculpt Animate 4D 2Mb 337.23
- Sharp JX100 C.Scanner .599.72

HARDWARE
- 1.3 Kickstart ROM 30.55
- 3.5" Int 2000 Drive 59.69
- 3.5" External Drive 59.69
- 512K A500 RAM/Clock ...29.61
- A590 20Mb Hard Drive..286.23
- Amiga 1500 ....643.90
- Citizen 124D 24 Pin 199.75
- Fatter Agnus.....................61.10
- GVP/2 A2000 2-8Mb RAM .169.67
- GVP/2 A2000 SCSI I/F+.....179.54
- GVP/2 A500 52Mb 0-8Mb ..519.82
- Naksha Mouse & Game ..29.61
- RAM Chip 256K CMOS.....6.11
- RAM 1Mb SIMM's 39.95
- SupraRAM A500 0.5-8Mb129.72
- SCSI HD Case/PSU/ Lead 109.98

PACKAGES
- Appetizer 30.55
- Graphics Starter Kit.........56.40
- Office By Gold Disk 99.64
- Starter Kit 51.23
- The Works Platinum 79.90

MULTIMEDIA
- AmigaVision (CBM).........95.88
- Hyperbook (Gold Disk)....54.99

PROGRAMMING
- AMOS Basic.....................37.60
- AMOS Compiler 27.73
- C PD (5 disks) 9.87
- Devpac 2 Assembler 43.71
- GFA Basic Compiler.........23.97
- GFA Basic Interp.............39.95
- Hisoft Bas. Compiler 57.81
- Lattice C 5.1 ....163.56
- Pascal PD 2.82
- Power Windows 56.40

RIBBONS
- 6 CBM MPS1230 Black...25.38
- 2 CBM MPS1270 Inks.....31.02
- 6 CBM MPS1500 Black...31.02
- 3 CBM MPS1500 Colour.36.66
- 6 Citizen 120D.................19.74

SOUND
- Audiomaster 3 S/W 49.82
- Bars & Pipes Pro...........219.96
- Deluxe Music...................55.93
- MasterSound Sampler 31.96
- MIDI Plug Interface 25.38
- Music X 1.1 ....109.98
- Music X Junior.................66.27
- Sonix 2 ....52.17
- Sound Trap 3 Sampler 30.55
- Tiger Cub 69.56

SPREADSHEETS
- Advantage 75.67
- Superplan........................49.82

UTILITIES
- ARexx..............................33.84
- B.A.D. Optimiser 31.96
- BBC Emulator 35.72
- Byte 'N Back....................20.45
- CrossDOS 24.91
- Directory Manager...........35.72
- Disk Master 2 ....49.82
- Doctor Ami 40.89
- DOS 2 DOS......................30.55
- Enhancer 1.3....................15.04
- GB Route Planner ....Query
- Mavis Beacon Typing......27.73
- Quarterback HD Backup .39.95
- Quarterback Tools 61.10

VIDEO
- Deluxe Video 3.................59.69
- Digi View Gold 4............109.98
- Hitachi Camera/Lens.....204.45
- Home Titler......................34.78
- Minigen Genlock 101.99
- Scala Presentations 189.88
- Video Studio 114.68
- Video Titler 84.60
- Vidi Complete Solutn.....159.80

WORDPROCESSORS
- Excellence 2....................94.94
- KidsType For Children.....24.84
- Kindwords 2 ....35.72
- PenPal 1.3.......................79.90
- Protext 4.3.......................69.56
- Protext 5........................101.99
- Protext 5.5 ....Query
- ProWrite 3+ 101.99
- QuickWrite.......................39.95
- Scribble Platinum 42.77
- TransWrite.......................32.90
- Wordperfect...................189.88
- Wordworth.......................99.64

SPECIALS (phone condition)
- Battlechess......................15.51
- Deluxe Paint 3..................49.82
- Deluxe Video 3.................59.69
- Pagestream 1.8...............79.90
- Populous & Prom Lands .19.74
- Pro Page 1.3 ....99.64
- Sim City & Terrain Ed 19.74
- The Works Platinum........79.90
- Their Finest Hour Sim 18.33

Richard & Angela Howe: Applied Research Kernel
Corve Farmhouse, Corve Lane,
Chale Green, Nr. Ventnor, PO38 2LA, U.K.

POST & PACKING (on items averaging less than 1Kg).
U.K. £0, Special Delivery £3.29, Securicor £9.87.
BFPO & CHANNEL ISLANDS £0, Special Delivery £3.29.
EUROPE £5 1st item + £3 for each additional item.
WORLD £12 1st item + £9 for each additional item.

CHEQUES London Sterling to A.R.K. Cheques may clear.
NORMAL DESPATCH Stock 24 hrs. Supplier 48 hrs.
EXPORT & BFPO Remove UK VAT (£/1.175) (Not Books)
V.A.T. Prices include V.A.T. Books are zero rated.
PRICES Are necessarily subject to change.
MEMORY Assume 1Mb RAM to load, unless stated.

Visitors are always welcome by appointment

TECHNOMANIA

Commodore Amiga Cartoon Classics Pack

3 Great Games
Lemmings (Psygnosis' Smash Hit)
The Simpsons versus the Space Mutants
Captain Planet and the Planeteers

Also Deluxe Paint III (Electronic Arts Superb Art Package) and Commodore's A501 512K Ram Expansion

£359.99

Commodore Amiga 1500

1 Megabyte of memory, two 3.5" disk drives and the following software:
Toki, ELF, Puzznic, Home Accounts and The Works (Integrated word processor, spreadsheet and database)

£659.99

With Philips CM8833 Mk2 Colour Monitor

£889.99

MONITORS

- Commodore 1084S £259.99
- Philips CM8833 Mk2 (inc. cable, free copy of F19 and one year on site maintenance) £244.99

PRINTERS. (all printers include cable)

- Citizen 120D+ £134.99
- Citizen 124D...£194.99
- Citizen Swift 9..£194.99
- Citizen Swift 24..£284.99
- Optional Colour Kit for Swift printers £34.99
- Seikosha SP1900AI (9 pin Dot Matrix).........£124.99
- Canon BJ10E...£264.99
- Star LC20..£154.99
- Star LC200 colour £229.99
- Star LC24-200 mono...................................£259.99
- Star LC24-200 colour..................................£299.99

ACCESSORIES

- Cumana CAX354 External Disk Drive £59.99
- 512K memory upgrade with clock £31.99
- Squick Replacement Mouse £14.99
- Naksha Mouse with Operation Stealth £26.99
- Golden Image Optical Mouse........................£36.99
- Commodore A590 20Mb Hard Drive..........£289.99
- Dataflyer 500 fitted with 52Mb Hard Drive..£329.99
  Please phone for pricing of 105Mb, 210Mb and 420Mb hard drives.
- VXL030 25MHz Accelerator Board for Amiga 500, 1500 & 2000 ....£259.99
- VXL030 40MHz Accelerator Board for Amiga ....POA
  Maths-Processor (FPU) upgrades and up to 8Mb of 32 bit memory also available for VXL030.
- KCS PC Emulator £224.99

Many other products available. Please phone for a price on your specific requirement.

All prices include 17.5% VAT and Next Day Delivery on hardware

Access VISA

TECHNOMANIA,
13 WELLBURN STREET
DUNDEE, TAYSIDE DD2 2RR.
PHONE: 0382 22323 FAX: 0382 400444

Please allow five working days for cheque clearance. Prices are subject to change without prior notice. Orders received by 3pm despatched same day.

Cliff's Code Conundrum

Technical editor Cliff Ramshaw presents the winner of the Code Conundrum set in issue 5

Ladies and gentlemen, welcome once more to that singularly fascinating section of the magazine: Cliff's Code Conundrum. This month, we have for your delectation the winning solution to the Conundrum set in issue five, which was to write a program which would recursively search directories for a named file.

Tony Rushbrook, of Dartford in Kent, came up with the best solution. It is written in C (I was surprised to find no Basic entries in the post bag, I must say) and as you can see from the listing, it is designed in a very neat, modular way. Tony will be receiving a crisp £50 cheque for his efforts.

The program accepts wildcards in the filename to be searched for, both of the AmigaDOS variety (# and ?) and of the Unix/MS-DOS type (*). The program uses the technique of recursion to ascend and descend the directory trees as required during the search for files.

AND NOW...

The next tortuous, titillating teaser requires you to write a textual analysis program. I don't want anything too heavy, just a program which will take a text file, count the number of words and sentences, give an average sentence length and the average number of commas, colons and semi-colons in each sentence. What could be easier?

As usual, any language is permissible, but make sure that you include the source code. Also, include an SAE if you want your disks returned (programs submitted as listings only will not be considered – I've better things to do than typing in other people's programs). Bear in my mind that we will be printing and possibly distributing on disk the winning solution. AS

LISTING • LISTING • LISTING • LISTING • LISTING

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <proto/dos.h>
#define VERSION "1.0"
#define NORMAL "\2330;31;40\155"
#define COLOR1 "\2330;33;40\155"
#define COLOR2 "\2330;32;40\155"
#define DELEOLN "\233\113"
/* by Tony Rushbrook */
void main (argc,argv)
int argc;
char *argv[];
{
char filename[108];
char pathname[108];
short int i;
fprintf(stderr,"%sFIND V %s, by Tony ↵
Rushbrook
1991%s\n",COLOR2,VERSION, NORMAL);
if (argc==1) /* help! */
{
fprintf(stderr,"USAGE: %s [<search ↵
pathname>] <filename>\n",argv[0]);
}
else
{
strcpy(pathname,argv[1]);
i=strlen(pathname);
while ((i!=0) &&
(pathname[i-1] !='/')&&
(pathname[i-1] != ':')) i-;
strcpy(filename, &pathname[i]);
pathname[i]=0;
fprintf (stderr,"%sFound %d ↵
entries.%s%s\n",COLOR2,
Search(pathname,filename),DELEOLN,NORMAL);
}
exit (0);
}
DisplayParent(TempHD,OutputHD)
BPTR TempHD;
FILE *OutputHD;
{
char Name[108]="";
short int i;
CalcPath (TempHD,Name);
i=0;
while (Name[i] != '/') i++;
Name[i] = ':';
if (Name[strlen(Name)-1] =='/') ↵
Name[strlen(Name)- 1]=0;
fprintf (OutputHD,"%s",Name);
return TRUE;
}
CalcPath(TempHD,TempString)
BPTR TempHD;
char *TempString;
{
BPTR ParentHD;
struct  FileInfoBlock *InfoBlock;
InfoBlock = malloc(260);
if (ParentHD= ParentDir(TempHD))
{
CalcPath(ParentHD, TempString);
UnLock(ParentHD);
}
Examine(TempHD,InfoBlock);
sprintf (&TempString [strlen ↵
(TempString)],"%s/",InfoBlock- ↵
>fib_FileName);
free(InfoBlock);
return TRUE;
}
Search(SearchDir, SearchName)
char *SearchDir;
char *SearchName;
{
BPTR OldHD;
BPTR SearchHD;
struct FileInfoBlock *InfoBlock;
*int Counter=0;
SearchHD=Lock(SearchDir, ACCESS_READ);
if (!SearchHD) fprintf (stderr,"ERROR: ↵
No such search directory: ↵
%s\n",SearchDir);
else
{
InfoBlock = malloc(260);
OldHD=CurrentDir(SearchHD);
fprintf (stderr,"%s",COLOR1);
DisplayParent(SearchHD,stderr);
fprintf (stderr,"%s%s\r",DELEOLN,NORMAL);
Examine(SearchHD, InfoBlock);
while (ExNext(SearchHD, InfoBlock))
{
if (compare(InfoBlock- >fib_FileName ↵
,SearchName))
{
BPTR TempHD;
TempHD=Lock(InfoBlock- >fib_FileName, ↵
ACCESS_READ);
if (TempHD)
{
Counter++;
DisplayParent(TempHD, stdout);
if (InfoBlock->fib_DirEntryType>0) ↵
fprintf(stdout,"/");
fprintf(stdout,"\n");
UnLock(TempHD);
}
}
if (InfoBlock->fib_DirEntryType>0)
{
Counter+=Search(InfoBlock->fib_ ↵
FileName,SearchName);
}
}
SearchHD=CurrentDir(OldHD);
fprintf (stderr,"%s",COLOR1);
DisplayParent(OldHD,stderr);
fprintf (stderr,"%s%s\r",DELEOLN,NORMAL);
free(InfoBlock);
UnLock(SearchHD);
}
return Counter;
}
compare(Master,Wildcard)
char *Master;
char *Wildcard;
{
int Mc=0,Wc=0,Ws=0;
int wildjump=0;
for (;;)
{
if (!strncmp(&Wildcard[Wc],"*",1)) ↵
wildjump=1;
if (!strncmp(&Wildcard[Wc],"#?",2)) ↵
wildjump=2;
if (wildjump!=0)
{
Ws=Wc+wildjump;
Wc=Ws;
wildjump=0;
}
else
{
if ((Master[Mc]==0) && (Wildcard[Wc] ↵
!=0)) return FALSE;
if ((toupper(Master[Mc])!= toupper ↵
(Wildcard[Wc])) && (Wildcard[Wc]!='?'))
{
if (Ws==0) return FALSE;
Mc-=Wc-Ws;
Wc=Ws;
}
else if (Wildcard[Wc]!=0) Wc++;
if (Master[Mc] != 0) Mc++;
}
if ((Master[Mc]==0) &&(Wildcard[Wc] ↵
==0)) return TRUE;
}
}
```

GENIUS DIGITIZING TABLET

£129.99

COMPLETE FOR THE AMIGA



ADD A PROFESSIONAL TOUCH TO YOUR DRAWING / CAD WORK

- With the Amiga Genitizer graphics tablet you can streamline the operation of most graphic or CAD programs
- The Genitizer graphics tablet utilises latest technology to offer up to 1000 dpi resolution at the tip of a stylus
- Complete 9" x 6" digitizing area plus super accurate stylus combine to enable fast, accurate and easy control
- Works by "mouse emulation" so the Genitizer will work with most packages where mouse input is the usual method - Deluxe Paint, Photon Paint, CAD Packages etc. etc.
- Supplied with template for Deluxe Paint.
- Full easy to follow instructions.
- This is the input method used on professional systems - now you can add a new dimension to graphics/CAD.
- Fast input of drawing by "tracing" is made easy - plus "absolute reference" means you can move around the screen many times faster than by a mouse.
- The Genitizer fits in the serial port of your Amiga 500/1000/2000 and "co-exists" with mouse.
- Unlike a mouse the Tablet gives absolute co-ordinates so that tracking and menu selections are possible from the tablet face.
- A pressure sensitive switch built into the stylus tip activates the Tablet overriding the normal mouse input. When you are not using the Tablet you have normal mouse control
- Complete system - Graphics Digitizer Tablet, Stylus, Deluxe Paint Template, Power Adaptor, Test Software, Interface Unit plus Driver program - no more to buy!

DATEL Electronics Limited

HOW TO GET YOUR ORDER FAST!

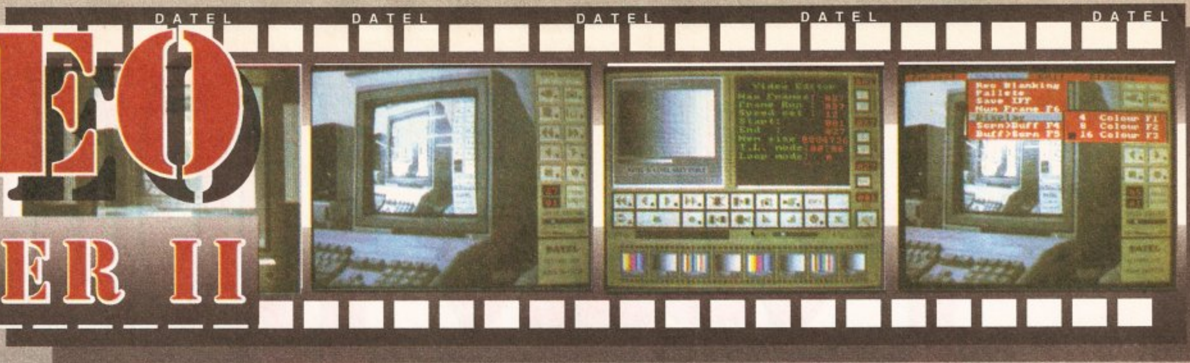
TELEPHONE [24Hrs] **0782 744707** CREDIT CARD ORDERS

ORDERS NORMALLY DISPATCHED WITHIN 48 Hrs. ALL CHEQUES/POSTAL ORDERS MADE PAYABLE TO....

Access **DATEL ELECTRONICS LTD.** VISA

GOVAN ROAD, FENTON INDUSTRIAL ESTATE, FENTON, STOKE-ON-TRENT, ST4 2RS, ENGLAND.
FAX 0782 744292 TECHNICAL/CUSTOMER SERVICE 0782 744324

VIDEO DIGITIZER II





ONLY £89.99

NOW YOU CAN DIGITIZE PICTURES FROM ANY VIDEO CAMERA OR VCR

- Completely newly designed interface that plugs into the expansion connector of the Amiga 500 or internal connector of the Amiga 2000.
- Standard phono video input 0.5 to 2.0 volts to take signals from TV, video or camera.
- Control brightness, contrast and throughport on A500 version.
- Frame grab in 1/50 second, record update up to 3 frames per second.
- Single or continuous update in 4, 8 or 16 grey levels.
- Play frames backwards or forwards up to 15 frames per second.
- Save Raw, IFF or sequence files.
- Automatically adjust for maximum number of frames according to memory available.
- Display 256 x 256 pixels, but optional 320 x 256 IFF Save. Screen editing features Cut, Copy, Brush, Paste and Undo. Effects menu to reverse pos/neg, compress, etc.
- Second display editor controls sequence production: Record, Play, Insert, Clear, Delete Frames.
- Set start and end position number of frames saved, number frames, step backwards and forwards, loop, etc. Time lapse feature adjustable in 1 second increments to 1 hour between each frame. Ideal for capturing flowers opening, sky movements, special effects, etc.
- Separate player programs included to insert into your own program disks. Hard disk transfer program.
- Please state A500 or 2000 version when ordering.



NOW WITH FULL COLOUR OPTION

WITH THE ADDITION OF THE RGB SPLITTER, TO THE VIDEO DIGITISER II YOU CAN OBTAIN COLOUR IMAGES IN ONLY 1 SECOND!!

RGB COLOUR SPLITTER
ONLY £79.99

BUY VIDEO DIGITISER II PLUS RGB COLOUR SPLITTER FOR
ONLY £149.99

- The Splitter unit plugs alongside the Digitiser and a lead is supplied to couple the two units together.
- Full adjustment of Red, Green and Blue signals together with a saturation control enabling you to take full control over any image.
- The Splitter is switched in software and comes complete with Digitiser Colour Software.
- You can select single continuous colour or B/W input. Files can be saved in Raw 4096 colour format, 8 or 32 colour IFF files or 16 shade B/W IFF.
- Features include full pallette control editing of frame and colour retouch calculator.
- Input from camera, camcoder or video recorder (paused). No more messing with colour filters.

DATEL Electronics Limited

HOW TO GET YOUR ORDER FAST!

TELEPHONE [24Hrs] 0782 744707 CREDIT CARD ORDERS

ORDERS NORMALLY DISPATCHED WITHIN 48 Hrs. ALL CHEQUES/POSTAL ORDERS MADE PAYABLE TO....

Access DATEL ELECTRONICS LTD. VISA

GOVAN ROAD, FENTON INDUSTRIAL ESTATE, FENTON, STOKE-ON-TRENT, ST4 2RS, ENGLAND.

FAX 0782 744292 TECHNICAL/CUSTOMER SERVICE 0782 744324

A/F VIDIGI

PUBLIC DOMAIN

GREAT SOFTWARE

CAN BE YOURS FOR AS LITTLE AS ABSOLUTELY, TOTALLY, DEFINITELY, VERY NEARLY, JUST ABOUT NOTHING AT ALL. (HONEST)

Owning an Amiga, PC or ST now means that you can buy incredibly good software for little more than the price of a disk. Stunning games, utilities, demos, graphics, word processors and more can be found in Public Domain and Shareware software.

But (but! but!!) where do you start? How do you know which programs are completely wonderful and which ones should be re-formatted instantly? What's the best way to buy PD? And – whilst we're at it – just what *is* PD anyway?

For these answers and a whole trainload more, you'll need a new magazine called **PUBLIC DOMAIN**.

- Every issue is **packed full of reviews** – PD programs assessed for the Amiga, PC and ST.
- Every review is **screenshotted**. You can see exactly what you'll be buying.
- Every copy of PUBLIC DOMAIN comes with an incredible **program-packed coverdisk** – so you can get the very best PD for your machine every time.
- Every page is in **glorious full colour**, so you'll have unrivalled quality.
- And every edition of PUBLIC DOMAIN is backed by the full editorial resources of **Europe's most successful** news-stand computer magazine company, Future Publishing.

PUBLIC DOMAIN comes to you from the company that brings you Amiga Format, PC Format, ST Format, Amiga Shopper, PC Plus, Commodore Format, Your Sinclair, New Computer Express, Amiga Power, Amstrad Action, PC Answers, Sega Power and 8000 Plus; markets leaders all.

First issue on sale October 3rd at £2.95

INCREDIBLE PACKAGE! MASSIVE MAGAZINE PLUS PROGRAM PACKED COVER DISK!



IF YOU WANT OUR ADVICE, BUY IT!

Cracking the Shell

How to create a multi-user system with little more than a toilet roll and some sticky-backed plastic. Mark Smiddy presents part one

While I was compiling the book Mastering AmigaDOS 2 (available through our sister magazine Amiga Format) with Bruce Smith, we often found that we both needed to use the Amiga at the same time. The simplest method would have been to buy another A3000, but at the time Amiga 3000s were in short supply and very expensive; they still are. For the sake of speed, the only solution was to connect two machines back-to-back using AmigaDOS 2 on both. Impossible? Well, it might seem like that – especially when you realise that the second machine need not be an Amiga at all! In fact, just about any small computer system you happen to have lying around can be pressed into service. You will need the following items:

Remote (parasite) machine

- A computer with a serial interface.
- A null modem cable with connections for the Amiga (see note below)
- A simple terminal package for the second micro
- An assistant

Host (fileserver) machine

- Any Amiga
- Either AmigaDOS 1.3 or better
- or AmigaDOS 1.2 and AUX from the Fish PD collection

Note: The A1000 and A2000 models have a non-standard serial interface. Although it will be possible to use these, you must get the correct lead as a standard cable fits the printer port. This does not affect the B2000 machine.

On the remote computer front, you can typically use another Amiga, an Atari ST, an Amstrad PCW with the serial port option, an MTX 500, an Acorn BBC B, and most cheap PC clones. If you do not have any of these, you may find a cheap CP/M machine at amateur (ham) radio rallies. Ham radio enthusiasts tend to use CP/M machines for packet radio, and a suitable second-hand setup can be had for as little as 30 quid. Whatever you do, try not to spend too much money – and read the whole of this article before parting with any cash. Using the Amiga in this way is simple but raises some interesting problems.

GETTING STARTED

Interfacing two machines in this way is relatively easy. First of all, connect them via the serial ports using your null modem cable.

Once the two machines are connected, you must decide on a serial protocol. That is, the way the machines will talk to each other. As an analogy: it's no use having the Amiga speaking Serbo-Croat to the remote and the remote trying to answer back in ancient Greek.

Protocols in serial communications are just like language – so long as the two speakers agree to speak the same tongue there is no problem. There are four main parameters to consider here (if you have been following our comms features you should already be familiar with them). These parameters are:

- Baud rate – the transmission speed
- Word length – the number of bits in each data byte
- Parity – error checking
- Stop bits – the number of bits to send after each data byte

Errors in setting all of these parameters are what give rise to garbage being received.

For the purposes of this type of communication, a fairly fast data rate is required. In practice some setups refuse to work at speeds exceeding 4,800 baud; the best speed can be achieved through trial and error. The other parameters should be set to 8 data bits, no parity and 1 stop bit. (Comms nuts refer to this as 4800-8n1.) You should set these at the Amiga end with the Preferences tool, and at the remote end with whatever comms package you are using.

TESTING 1-2-3

Once the computers are configured correctly you can perform the initial test. Open a Shell on the Amiga and enter the following (remember not to type the 1> part; this just shows where each new line starts):

```
1>ECHO >T:msg "Hello World"
1>COPY T:msg to AUX:
```

alternatively you can enter:

```
1>ECHO >AUX: "Hello World"
```

However, the latter method has been found to lock the AUX device on occasion, thus preventing two-way communication. The remote computer should echo the message 'Hello World'. If it didn't, follow the debugging guidelines which we will be printing next month. If it did, you are now ready to enter the world of the multi-user Amiga. Note that if at any time the Amiga or the remote terminal freezes you may have to reset the machine.

Now enter:

```
1>NEWSHELL AUX:
1>
```

Nothing should happen at the host machine (your Amiga); instead, the new shell will start on the remote terminal. Its screen will look something like this:

```
New shell process 2
1>
```

Now ask your assistant to enter 'LIST' on the terminal. This will provide them with a listing of your Workbench disk or the currently selected volume (disk). The LIST command is usually left resident in the 1.3 startup-sequence, and this avoids troublesome disk swapping if you only have one drive. This is a

continued on page 106



"Dust off those old computers, we're getting down to some serious connectivity..."
Mark Smiddy

IMPORTANT

Never, ever plug or unplug a serial lead without first switching both computers off. Failure to comply with this caution can cause serious damage to your hardware and bank account.

BEGINNERS — BEGINNERS START HERE — BEGINNERS

What exactly is a 'multi-user system' then?

A multi-user system is exactly what its name suggests – one computer system which can be used by more than one person at the same time. Such systems normally run on powerfull mainframe computers, but there's no reason why your Amiga shouldn't have at least one remote terminal attached.

At least one what?

Remote terminal. That is, a keyboard and screen which are directly attached to the computer but which don't have to be right next to it. With the system described here, you could have one person using the Amiga from its own keyboard, and another connected to the computer using a remote terminal in another room.

So how come two people can use the same computer at the same time?

That's because the Amiga is a multi-tasking machine. In other words, it can be doing more than one thing at the same time. In this case, it will be dealing with two separate sets of inputs, from two different people.

continued from page 105

nuisance in any case, but when two people are sharing one machine it can become a nightmare of Orwellian proportions.

PROBLEMS, PROBLEMS...

Before going any further, it is worth noting that this technique is anything but perfect – however, at least it's cheap. The main problem is that it only works with commands which only affect the CLI or Shell window. In other words, programs which rely on Intuition (and that includes the ED editor) will not work. Any Intuition programs launched on the terminal appear on the host machine – usually when the operator is in the middle of something!

Actually, it can be quite amusing to install a beginner on the Amiga, launch a Workbench hack such as Viacom from the remote and watch them squirm! This is because the remote terminal is purely operating as a keyboard and screen – not as a separate computer. Because of this it is not strictly correct to call the host Amiga a network fileserver.

Regardless of the above restriction, though, there are many CLI-based commands – not just AmigaDOS ones – which function correctly.

WHAT NEXT?

At this point you should be able to control many aspects of your machine remotely from your old hardware. But what about sending messages between the two machines? In a real situation the two terminals could be rooms apart, so chatting is out of the question – or is it? I've already mentioned that the remote terminal is, in reality, just an extension of the existing machine – so provided you can send messages between two Shells, you can send messages between the two machines.

The 1.3 release of AmigaDOS saw the inclusion of FIFO pipes. The extension to support them was written by Matt Dillon, and they provide one method of communication between Shells. For this article though, I'll concentrate on a different method. Each has pros and cons – but this should serve as an interesting introduction to the use of files as they compare to pipes. Listings 1 and 2 are the command scripts used to communicate using a form of e-mail: that is, you leave messages for the other party which can be collected later. Mail-2-Remote should be used by the person sitting at the Amiga, Mail-2-Host by the person at the remote terminal. The two programs are almost identical so I'll just describe Mail-2-Remote here.

1. This first line is very important because it determines how the script will react to command lines. In this case, the script is given two parameters: a message and a filename. As you will see, the script usually determines its own filenames but you can override this feature by entering a name here. You must enclose the message body text in quotes (speech marks) or the script will fail. Typical examples might look like this:

```
1>mail-2-remote "Hi Cliff! ↵
Nice weather huh?"
1>mail-2-remote "Ol' man ↵
river" name=river
```

JARGON BUSTING

FIFO – First In, First Out. A drainpipe buffer. A simulated device that information can be read from in the order it was written – this can be likened to dropping marbles down a drainpipe (but it's far less noisy).

Network – Two or more computers connected together. One computer acts as a host, keeping all the programs on the a large hard disk and driving other peripherals. The terminals can either download software into their RAM or sometimes run in virtual mode. The system described here is a simple virtual system.

Redirection – In AmigaDOS this is the action of sending screen output to a file or other device, or taking keyboard input from a file or device other than the keyboard. Redirection operators are > (send to), < (get from) and >> (append to).

2,3. Set the bracket characters to { and } respectively. You may remember that the brackets default to < and >, which conflicts with the redirection operators used extensively in this program.

4. This line comes into effect if no value is supplied to the name (filename) parameter. The default name is 'ItsForYou.hsts'.

5. This line is used to read and delete any new mail messages from the remote terminal. It's very complex, so I'll break it down into its component parts:

5.1 `list`
This is the 'list' command itself.

5.2 `>T:ItsForMe{$$}`
This names the destination script file which is created at 5.4. The file will be place in the T: assignment (usually RAM:T) and called ItsForMe[XX], where XX is the process number of the current Shell; this allows the script to create a unique name for itself in the multi-tasking environment.

5.3 `T:#?.rmt`
This selects any mail messages in T: which have been sent from the remote. This is done using the AmigaDOS 'everything' wildcard #? with the extension '.rmt'. The .rmt extension is added to every message written by Mail-2-Host. This program does much the same thing at step 10 using the extension .hst.

5.4 `lformat "TYPE ↵ %s%s*nDELETE %s%s*n"`
This creates a temporary script program to read and remove the current messages. Assuming that

continued on page 108

LISTING 1 • MAIL-2-REMOTE

```
1.  .key message,name/k
2.  .bra {
3.  .ket }
4.  .def name ItsForYou.hsts
5.  list >T:ItsForMe{$$} T:#?.rmt lformat "TYPE      ↵
        %s%s*nDELETE %s%s*n"
6.  execute T:ItsForMe{$$}
7.  if "message" EQ ""
8.  quit
9.  endif
10. if exists T:{name}.hst
11. ask "Message pending. Delete y/N?"
12. if not warn
13. quit
14. endif
15. endif

16. echo >T:{name}.hst "Posted on: " noline
17. date >>T:{name}.hst
18. echo >>T:{name}.hst "{message}"
```

LISTING 2 • MAIL-2-HOST

```
.key message,name/k
.bra {
.ket }
.def name ItsForYou.rmts
list >T:ItsForMe{$$} T:#?.hst lformat "TYPE %s%s*nDELETE   ↵
%s%s*n"
execute T:ItsForMe{$$}
echo >>T:{name}.rmt "{message}"
if "message" EQ ""
quit
endif
if exists T:{name}.rmt
ask "Message pending. Delete y/N?"
if not warn
quit
endif
endif
echo >T:{name}.rmt "Posted on: " noline
date >>T:{name}.rmt
echo >>T:{name}.rmt "{message}"
```

NORTH-EAST AMIGA-USERS

* Don't send away for it.............WAIT!
* Visit our showroom first for.....

* A500 & 1500 Packs,
* **B**ooks, **S**oftware,
* **U**pgrades, **S**pares,
* **D**rives, **P**rinters,
* **A**ccessories
* **R**epair **S**ervice
* **A**dvice
* **D**emo's
* **D**iscs

AMIGA

Access

VISA

QUALITY OF SERVICE COMES FIRST AT:

Mon-Sat
9.30 to 5.00
091-510 3300
091-510 3939

Advance Electronics (NE) Ltd
1 Victoria Place, St Marks Road,
Millfield, Sunderland, Tyne & Wear

Future PUBLISHING

AMIGA SHOPPER

Production editor

Salary negotiable, according to experience

- Founded in 1985
- Now over 220 staff
- Market leader in computer titles
- Exciting launch plans
- Britain's fastest-growing publisher
- 17 national magazines: Amiga Shopper, Amiga Format, Amiga Power, Public Domain, PC Format, ST Format, New Computer Express, Commodore Format, Sega Power, Your Sinclair, Amstrad Action, 8000 Plus, PC Plus, PC Answers, Classic CD, Mountain Biking UK, Needlecraft,

Amiga Shopper is the leading magazine for serious users of the Amiga computer; no games here! We intend to lift the production standards of the magazine above the other run-of-the-mill computer titles, so we need a production editor who gets things done.

Superb subbing skills are essential; much of the work involves turning contributors' offerings into cogent English. Extracting copy from recalcitrant authors requires a strong personality. The ability to find a way out of an impossible situation would be useful, as would an eye for a striking headline.

We work entirely on Macs: DTP experience is essential. No prior knowledge of Amigas is required, so Amiga tech-heads with no publishing experience need not apply.

Please write with CV and details of current salary to the editor, Stuart Anderton.

Future Publishing Ltd, Beauford Court, 30 Monmouth Street, Bath BA1 2BW
Tel: (0225) 442244

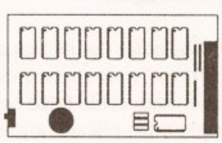
Credit Card Hotline
Tel: 0734 890588

Virgo DEVELOPMENTS

Sapphire House, Fishponds Road, Wokingham, Berkshire, RG11 2QJ.
Fax: 0734 891646

VISA

Amiga A500 RAM CARDS



V500: ½Mbyte expansion.
Upgrade your Amiga A500 to 1Mb. Chip/fast ram compatible, gold plated connector, On/Off switch.
ONLY £23.99

V501: ½Mbyte expansion + Clock.
As V500 + Battery backed real time clock
ONLY £27.99

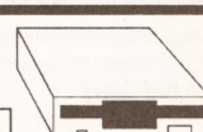
V2000: 2Mbyte expansion + clock.
Upgrade your Amiga A500 to 2.5Mb. Expandable in ½Meg stages, compatible with Kickstart 1.2 & 1.3, On/Off switch, gives 1Mb of chip ram + 1.5 Mb fast ram if required. Comes complete with Gary connector & full installation instructions.

V2000 bare board **£37.95**
V2000 + 2Mbyte **ONLY £104.95**

V4000: 4Mbyte expansion + clock.
Upgrade your Amiga A500 to 4.5 Mb. Same as V2000 but gives an additional 4Mb of fast ram or 3.5Mb fast + 1Mb chip ram

V4000 bare board **£63.00**
V4000 + 4Mbyte **ONLY £198.00**

External 3½" Disk Drive



Top quality, low noise, high reliability 1meg drive.
£50.95

Ram chips 256Kx4
A590 compatible
£17.59 for ½Mbyte

3½" DSDD
2 for 1 guarantee
£4.45 for 10

A UK COMPANY

AUDIO SHOP

Midi Interface	£19.50
Stereo Sound Sampler	£29.00
Sound Demon	

Quality stereo sound from your Amiga, featuring top quality amplifier with 2 superb 3-way 30W speakers & jack for headphones. £39.95

Dispatch within 24 hours
12-month guarantee.
Cheques, Postal orders to Virgo Developments at above address.
Express Courier delivery (UK mainland only) £5.50

All prices include VAT, postage & packaging. No hidden charges

continued from page 106

the remote's operator has used the 'name' option to create a message called hello, the resulting program would look like this:

```
TYPE T:hello.rmt
DELETE T:hello.rmt
```

6. This runs the script created at Step 5, reading any pending messages and deleting them afterwards. This is done to prevent a lot of useless files jamming up the T: assignment.

7-9. These steps are used to determine if you have actually entered a message – if not, the program stops. This allows you to check for mail periodically. (Thanks to the nature of the Amiga, it is possible to design a special version of the Mail-2 system which will periodically check for incoming mail. More on that later.)

10. This determines if a message file already exists with the same name. This means that the other terminal has not yet read the message, so you are given the option to leave or update it…

GOT A PROBLEM ?

If you get stuck with AmigaDOS or there is anything specific you would like to see covered here, drop a line detailing your conundrum to: Mark Smiddy, *Amiga Shopper*, 30 Monmouth Street, Bath BA1 2BW. Sorry, no personal correspondence can be entered into. Desperate people, with no regard for telephone bills, can e-mail me on CIX as 'smidoid' or find me lurking in the 'amigashopper' conference.

COMMANDING SCRIPTS

To get the best effect from the scripts described here, you should set the 'S' protection bit of each so that they work like real commands. Assuming you have stored the scripts in the S: directory assignment, the following will do the trick:

```
1>SPAT PROTECT S:#? +S
```

The command SPAT used here is not in the C: directory, it is a script in its own right which is used to add single pattern matching facilities to commands which lack them. Don't worry about how SPAT works, it just does.

11. …here. Note that the default operation (if you just press [Return] at the prompt) is to leave the message untouched. As an aide-memoire, the 'y/N?' prompt indicates this with a capital N.

12. This determines what happens at the 'ask' statement (Step 11). 'ask' sets the 'warn' condition if Y was pressed and clears it otherwise. By negating the action of 'if', with the 'not' switch, the script branches to step 14 when you enter Y.

13. If control reaches this point the script terminates immediately.

14,15. Close the two IF…ENDIF constructs opened at Steps 10 and 12 respectively.

16-18. These lines create a compound message using the current time to show the receiving party when the message was posted. Note the use of the append redirection operator '>>'. Under AmigaDOS 1.3 and above, this tacks the output of any command on to the end of an existing file.

OPENING THE MAIL

This system for reading your messages works – but it would be nicer to get the machine to read them for you. Listings 3 and 4 were devised to do just that. They work in a similar fashion to the others, but take more advantage of the Amiga's multi-tasking properties.

1. This defines the argument template for this script. Only one argument can be supplied here, the time delay in minutes. Unless you have a fast machine and a hard disk do not set this below 10 minutes. If no time limit is supplied, the script will check messages every 30 minutes (defined at Step 4).

2,3. Redefine the bracket characters as before.

4. Set the variable for the time limit to 30 if none is supplied.

5. This label is supplied so that the script has somewhere to return to during looping. In fact, the script has been designed to loop continuously until stopped; more of that shortly.

6. This line is identical to the one used in the Mail-2-Remote program. It displays and removes the current mail messages.

7-9. Check for the existence of the 'StopItNow' environment variable. Actually, this could have been a temporary file placed anywhere, but it is more convenient here. Note that this line is identical in both versions of this program – so once the variable is set, both users will cease to get update messages.

10. Here the script is executed as a new process with the 'run' command. This might seem a little strange, but a minor bug in AmigaDOS 'execute' causes the skip at Step 12 to fail if it is not done.

11. This puts the script to sleep for the predetermined time – default of 30 minutes in this case.

12. After the wait at Step 11 times out, this forces the script to go back and do it all again.

USING HOSTREAD

This script is an unusual one because it is designed to multi-task – even though it starts its own tasks too. There are two ways of doing this. The obvious way is:

```
1>RUN EXECUTE HostRead
```

The less obvious way is:

```
1>NEWSHELL
1>RUN EXECUTE HostRead
```

In the second case, you start a new Shell process before starting HostRead. This allows you to work as normal without the messages suddenly appearing in the middle of your screen. Note, however, that the second technique cannot be used on the remote terminal because the new Shell window will still appear on the host's terminal – phew. Also, once this script has been started it can only be stopped by setting the StopItNow environmental variable. You can do this thus:

```
1>SETENV StopItNow ON
```

● AmigaDOS 2 users only should enter:

```
1>ECHO >ENV:StopItNow "ON"
```

The actual value is arbitrary, but once this has been done, the program will halt during its next loop. ***That's all for now; next month I'll look more at the dual-user system and at using pipes.*** AS

LISTING 3 • HOSTREAD

```
1.   .key time
2.   .bra {
3.   .ket }
4.   .def time 30
5.   Lab Start
6.   list >T:ItsForMe{$$} T:#?.rmt lformat "TYPE ↵
     %s%s*nDELETE %s%s*n"
7.   if exists env:StopItNow
8.   quit
9.   endif
10.  run execute T:ItsForMe{$$}
11.  wait {time} mins
12.  skip Start BACK
```

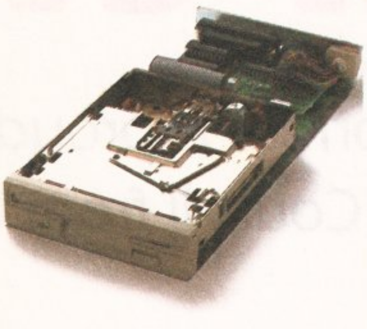
LISTING 4 • REMOTEREAD

```
.key time
.bra {
.ket }
.def time 30
Lab Start
list >T:ItsForMe{$$} T:#?.hst lformat "TYPE %s%s*nDELETE
%s%s*n"
if exists env:StopItNow
 quit
endif
run execute T:ItsForMe{$$}
wait {time} mins
skip Start BACK
```

POWER COMPUTING

NEW LOW PRICES

PC880B POWER DRIVE



- Built-in Blitz hardware copier
- Built-in virus blocker
- No annoying click when drive is empty
- 12 month warranty **£65·00**

PC880 POWER DRIVE **£55·00**

DUAL DRIVE

The only company to make the dual drive 'Quite simply, the best all rounder' ... Amiga Shopper Best Buy April '91

New Dual 3·5" Drive with built-in power supply, same features as PC880B **£110·00**

A500 Replacement Internal Drive



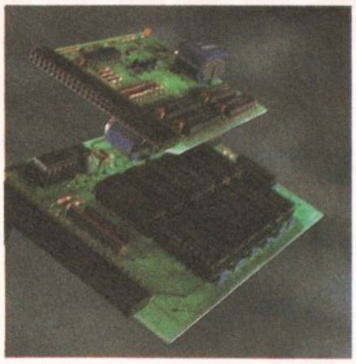
No case modification required	£49
40MB Slimline Hard Drive	£299
A500 Internal Anti-click board	£9·95

NEW BLITZ AMIGA

- Back-up your disks at lightning speed
- Copies from the internal to the external drive
- Backs-up an Amiga disk in as little as 40 seconds
- Backs-up other format disks (Atari, PC)
- Copies up to three external drives at once
- Stops ALL external drives from clicking
- Contains ANTI-VIRUS switch! – prevents viruses from being written into the bootblock
- Works on Amiga 500 or 2000 **£25**

Original Blitz **£15**

MEMORY



1·5MB Expansion Board **£79**
FULLY SUPPORTS 1MB CHIP RAM
MOST BOARDS DON'T
Plugs easily into your Amiga*

512 K RAM Card without clock	£24
512K RAM Card with clock	£29

* Fully compatible with 'Fatter Agnus' and 1MB Chip RAM Kickstart 1·3 and above, simple internal fitting

GVP Series 2 Hard Disk



- Fully SCSI compatible
- Up to 8MB FAST RAM on-board
- High speed "FAASTROM" controller
- Auto-boot from FFS partition
- All combinations available

50MB **£539** 100MB **£699**

NEW POWER SCANNER

- Scan from 100-400 DPI
- Simulate Grayscale
- IFF & Printer support
- Powerful Image edit software
- Crop, Cut Paste, magnify, edit
- Many more features **£159**

AMIGA 500

Amiga 500 512K	£330
Amiga 500 1MB	£350
Amiga 500 2MB	£395
Amiga 500 1MB + 40MB hard disk	£639

Packs do not include software unless specifically stated

Amiga 500 Internal Hard Drive



- 20MB formatted
- 2" Hard Drive
- High Quality ICD interface
- Simple plug-in fitting **£299**

ICD

ICD Adspeed	£175
ICD Flicker Free Video	£250
ICD FFV + VGA Monitor	£499
ICD AdRAM MEMORY EXPANSION	
0MB (A500 only)	£95
2MB (A500 only)	£179
4MB(A500 only)	£249

REWRITABLE OPTICAL HARD DISK



We are now able to offer the IBM optical hard disk for the Amiga 2000. This drive is fully rewritable, and stores up to 128MB on each removable 3·5" optical cartridge.

- 128MB 3·5" Cartridges
- Fully rewritable
- Fits into 5·25" drive bay
- Available as external unit with PSU
- SCSI compatible
- Fast 60ms Seek Rate
- High Quality - Manufactured by IBM

A2000 INTERNAL (no interface)	£999
Amiga 2000 EXTERNAL	£1199
SCSI Interface for Amiga 2000 (GVP/NEXUS)	£199
128MB 3½" Optical Media Cartridge	£36 each

GENERAL

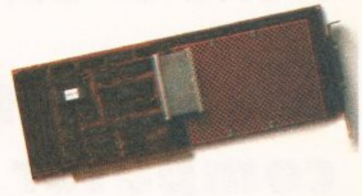
Hard wearing dust cover	£9
Philips colour monitor MkII	£249
KCS PC Power Board	£235
ATonce	£169
ATonce A2000	£199
Floppy disk (min quantity 50)	£0·34 each
Maxell multicolour disk (10)	£9·95
Golden Image Optical Mouse	£39
Power Mouse	£15

68040

- Accelerator board
- 50MHz
- Up to 32MB of RAM
- For Amiga 2000

£1999
(comes with 4MB)

NEXUS HARD CARDS



- High speed controller
- Up to 8MB RAM on board
- Easy to install
- Fully autobooting
- Compatible with GVP and ICD
- Nexus software

Bare **£199** 40MB **£349**
114MB NEC 20ms **£499**

GVP Series 2 Hard Card

- High speed 'FaastROM' controller
- Up to 8MB SimmRAM on board
- Fully autobooting
- Supports external SCSI devices

Bare **£199** 40MB **£349**
114MB NEC 20ms **£499**

GVP 'COMBO' Board

- 22MHz or 33MHz 68030 with 68882 numeric coprocessor
- Comes with 1MB RAM installed (4MB on 33MHz version)
- Expand up to 13MB (22MHz) or 16MB (33MHz) using custom Simms
- Full series 2 SCSI interface connecting directly to the 68030 bus

22MHz Combo with 1MB RAM	£799
33MHz Combo with 4MB RAM	£1495
40MB SCSI hard disk for Combo	£249
114MB SCSI Hard disk for Combo	£299
32-bit Simm 1MB	£99·95

CHIPS

256K x 4 DRAM	£5
1MB x 1 DRAM	£5
1MB x 8 Simm	£40
4MB x 8 Simm	£150
8372 Fatter Agnus	£49
A3000 Static Column RAM	£28

All prices include VAT, delivery and are subject to change   All trademarks acknowledged.   Specifications are subject to change without notice

Access

POWER COMPUTING LTD
Unit 8 Railton Road Woburn Road Industrial Estate Kempston Bedford MK42 7PN
Tel: 0234 843388 Fax: 0234 840234

Next day delivery £4·50

VISA

POWER COMPUTING U.S.A. 21 South 5th Street Suite 900 PHILADELPHIA-PA 19106 TEL. 215 922 0050 • FAX 215 922 0116

POWER COMPUTING SRL ITALY Via Delle Baleari, 90 00121 Ostia Lido ROMA 2 Lines (06) 5646310 • FAX 5646301

POWER COMPUTING FRANCE 15 Bld Voltaire 75011 PARIS FRANCE TEL. (1) 43570169 (6 lines) • FAX (1) 43380435

POWER COMPUTING ENQUIRIES TO ACL Engineering Perth AUSTRALIA (09) 481 0555

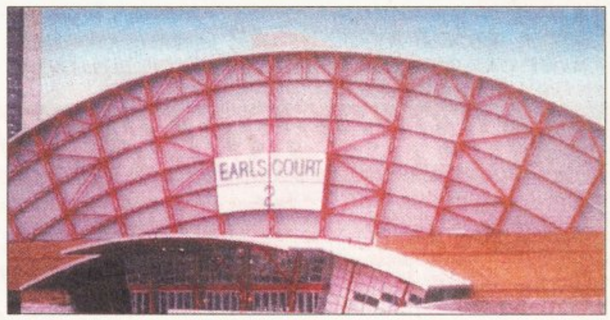
NEWTEK ▪ NEW HORIZONS ▪ DIGITAL CREATIONS ▪ MICRODEAL ▪ BITCON DEVICES ▪ RGB

AMIGA FORMAT presents World of Commodore

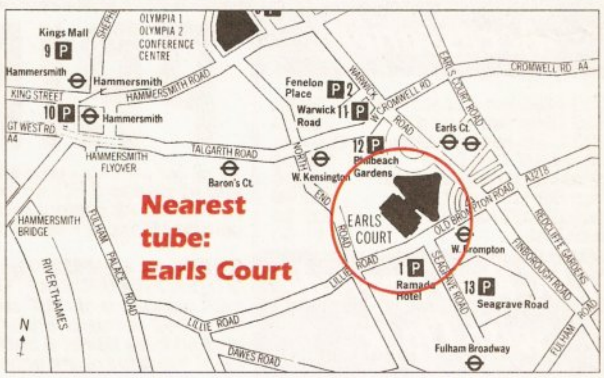
e greatest r held

ost the exhibition of the year, the
y to Sunday, November 15-17

Where, when and how



Where Earls Court II, heart of London
When November 15-17 1991
Times 9am-5.30pm November 15-16; 9am-4pm November 17
Cost Adults £6, under 14s £4
(but see the special Early Booker Offer)
Who'll be there? Commodore, Amiga Shopper, Amiga Power, Amiga Format, all the major hardware developers, dozens of software publishers, bargain-offerers, leisure publishers and anyone who's anyone in the world of the Amiga.
You want to get the best bargains for your Amiga? Get along to Earls Court on November 15-17





EARLY BOOKER OFFER: SAVE TIME, SAVE MONEY

The **World of Commodore** will attract tens of thousands of people, so avoid the queues by booking your tickets in advance.

And you'll even **save money** at the same time. Just fill in this form to make your life much easier.

YES I would like to have my tickets early, avoid all the queues and save £1.05 on every ticket, please.

Name ....

Address ....

....

....

Postcode ....

Number of tickets ....Adult (at £4.95 each)

..............................Under 14s (at £2.95 each)

Total payment ....

Method of Payment (please circle) Access Visa Cheque PO

Credit Card number ....Expiry date..............

CREDIT CARD HOTLINE 051-356 5085

Please make all cheques payable to **WORLD OF COMMODORE**

Send this form to

World of Commodore
PO BOX 2
Ellesmere Port
South Wirral
L65 3EA

WARNING: This offer closes on 8.11.91
If you don't want to cut up this magazine, photocopies are fine.

STEINER ▪ POWER COMPUTING ▪ HISOFT ▪ DIGITA ▪ HB MARKETING ▪ PRECISION...

AMIGA PACKS

ALL AMIGA PRICES INCLUDE VAT AND UK DELIVERY. ALL PRODUCTS ARE UK STOCK AND CARRY A FULL 12 MONTH COMMODORE WARRANTY. PLEASE RING US BEFORE ORDERING TO CHECK STOCKS AND CURRENT PRICES.

AMIGA A500 BASE A500 computer, mouse, tv modulator, manuals, Workbench, etc supplied 'bare' with no games software * STOCKS VERY LIMITED - SO HURRY * **£299.00**

AMIGA A500 BASE 1MB A500 computer with extra 512K ram expansion, mouse, tv modulator, manuals, Workbench, etc supplied 'bare' with no games software. * OUR RAM EXPANSIONS *DO NOT* INVALIDATE YOUR WARRANTY * **£325.00**

AMIGA A500 ASTRA A500 512k computer, mouse, tv modulator, manuals, Workbench, etc supplied with 10 great software titles (see A500 1MB ASTRA pack below for details) **£325.00**

AMIGA A500 1MB ASTRA Amiga A500 computer, 512K Ram expansion with clock and battery back-up, mouse, tv modulator, manuals, Workbench etc disks, plus the ASTRA 10 games pack including the following games : Datastorm, Dungeon Quest, E Motion, Grand Monster Slam, Kid Gloves, Powerplay, RVF Honda, Shuffle Puck Cafe, Soccer and Tower of Babel **£350.00**

AMIGA A500 1MB CARTOON CLASSICS Amiga A500 computer, 512K Ram expansion with clock and battery back-up, mouse, tv modulator, manuals, Workbench etc disks, plus The Simpsons, Lemmings, Captain Planet and Deluxe Paint 3 **£359.00**

AMIGA A1500 PACKS

AMIGA A1500 PACKS	1mb	3mb	5mb	9mb
AMIGA A1500 BASE A1500 computer with 2 x 3.5" 880k disk drives built in, and a mouse. The A1500 base pack is supplied with no software.	£599.00	£795.00	£875.00	£1000.00
AMIGA A1500 SOFTWARE consists of A1500 base pack and Platinum Works, D Paint 3, Populous, Simm City, Battle Chess, Their Finest Hour and 2 books	£655.00	£850.00	£930.00	£1055.00

NEW!! PROTAR A500 HARD DISK DRIVES

At last ... high quality hard disk drives for the Amiga A500. The new PROTAR range of A500 hard disks are here ... and just look at the specifications ...

* Perfect colour and fitting to the A500
* 5 times faster than the A590
* 8MB internal ram expansion facility
* 1 year REPLACEMENT warranty
* Auto parking & auto booting
* Sizes range from 20MB to 160MB
* Disk Cache versions
* Seperate PSU available
* Sub 24 millisecond access time
* Hard disk management software

PHONE TODAY FOR PRICES

Accessories

A500 512K ram upgrade + clock	£29.99
A500 1.5Mb ram upgrade	£99.99
A590 20Mb hard disk drive	£284.95
External 3.5" Disk Drive	£65.00
Golden Image Hand Scanner	£169.00
Amiga Stereo Scart Lead	£12.99
Amiga 8833 MkII Lead	£12.99
Mouse Mat	£3.50

512K Ram Upgrade with Clock

We are now stocking the new PROTAR 512K RAM UPGRADE WITH CLOCK. The neat, compact 4 chip design comes complete with box, instructions, on/off switch and a full 12 month warranty.

PROTAR 512K Ram with clock £29.99

We also have limited stocks of the genuine Commodore A501 512K Ram Expansion, which we are offering at the ultra low price of :

A501 512K Ram with clock £39.99

Please specify which 512K ram upgrade (either Protar or Commodore) when ordering from us.

PRINTERS

All of our printers come with a parallel cable to suit Atari ST, Amiga and all standard PC etc (other cables available at extra cost ... ask for details). All printers carry a full 12 months warranty. We only sell genuine UK stock - we do not offer inferior "grey imports".

SPECIAL OFFER! *For a limited period only we are offering a CITIZEN PRINTER STARTER PACK with all Citizen printers. The pack comprises of : 3.5" disk full of printer drivers for the ST, Amiga & PC; 200 sheets of fanfold tractor feed paper; 200 fanfold tractor feed address labels; 5 tractor feed envelopes all for only £12.99 on top of the price of the printer*

Citizen 120D + *(9-pin, 144 cps draft, 30 cps NLQ)*	£139.00
Citizen Swift 9 *(9-pin, 192 cps draft, 48 cps NLQ)*	£199.00
Citizen 124D *(24-pin, 144 cps draft, 48 cps LQ)*	£199.00
Citizen Swift 24 *(24-pin, 192 cps draft, 64 cps LQ)*	£299.00
Citizen Swift 24X *(24-pin, 15" carriage version of Swift24)*	£399.00
Star LC10 Mono *(9-pin, 144 cps draft, 34 cps NLQ)*	£155.00
Star LC200 Colour *(9-pin, 180 cps draft, 45 cps NLQ)*	£220.00
Star LC24-10 Mono *(24-pin, 180 cps draft, 60 cps LQ)*	£215.00
Star LC24-200 Mono *(24-pin, 200 cps draft, 67 cps LQ)*	£260.00
Star LC24-200 Colour *(24-pin, 200 cps draft, 67 cps LQ)*	£295.00
Star XB24-10 Mono *(24-pin Professional Series)*	£475.00
Star XB24-15 Mono *(24-pin 15" version of XB24-10)*	£600.00
Canon BJ10E Bubble Jet *(ink jet, portable and compact)*	£289.00
Hewlett Packard Desk Jet 500 *(ink jet, 3 pages per minute)*	£459.00

Philips 8833 MkII Colour Monitor

The Philips 8833 MkII is the perfect colour monitor for Amiga owners. With its stereo sound and super quality picture it really shows off the full capabilities of the Amiga. The Philips 8833 MkII also comes with 12 months on site warranty FREE!

8833 with Amiga cable £249.99

Or even better ....

We are proud to announce the introduction to our range of the new VISTO colour monitor. The VISTO C14M, made under official UK licence from Philips themselves, is identical in every respect to the Philips 8833 MkII including all inputs and outputs. But, VISTO have enhanced the looks of the monitor by replacing the case with a new upgraded better looking version. The VISTO C14M has a no quibble 12 month replacement warranty and comes free with cables for all Amigas and all Atari STs.

VISTO C14M £248.00

IF YOU WISH TO ORDER WITH US, THEN PLEASE SEND YOUR CHEQUES, POSTAL ORDERS, CASH ETC TO OUR MAIL ORDER ADDRESS OR RING OUR MAIL ORDER HOTLINE ANY TIME BETWEEN 10.00AM AND 12 MIDNIGHT, 7 DAYS A WEEK, AND USE YOUR CREDIT CARD, OR PAY A VISIT TO OUR SHOP, CHIPS COMPUTER CENTRE.

SHOWROOM

CHIPS COMPUTER CENTRE, 53 RUGBY ROAD, WORTHING, WEST SUSSEX, BN11 5NB.

TEL : (0903) 700804.

OPENING : MON TO FRI 10AM TO 6PM. SAT 9.30AM TO 5.30PM
FINANCE / CREDIT FACILITIES.
PART EXCHANGE CONSIDERED. NEW AND USED EQUIPMENT
ATARI STE, AMIGA AND PC COMPATIBLES ON DISPLAY.
ALL TYPES OF SOFTWARE (BUSINESS / LESUIRE).
REPAIRS UNDERTAKEN. TRAINING. INSTALLATION. ON-SITE WARRANTIES.

VISA

MAIL ORDER

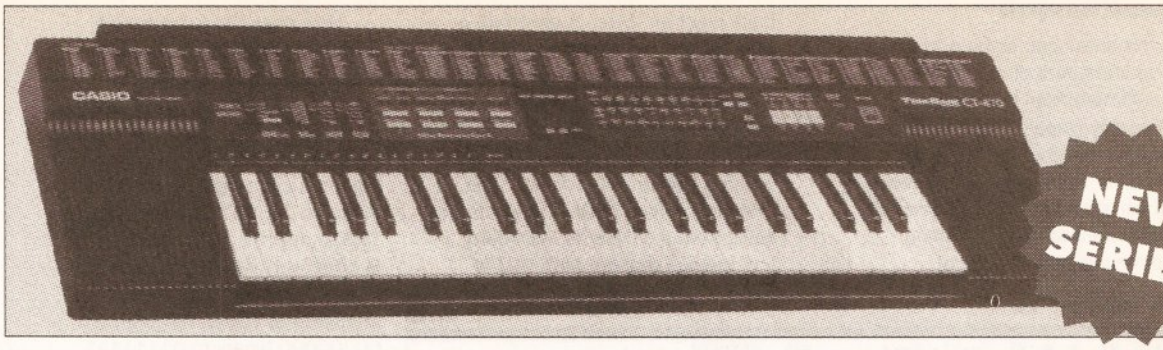
BEST PRICES (DEPT AS), 53 RUGBY ROAD, WORTHING, WEST SUSSEX, BN11 5NB.

TEL : (0903) 700714.

OPENING : 7 DAYS A WEEK 10AM TO 12 MIDNIGHT
ALL PRICES INCLUDE 17.5% VAT AND FREE DELIVERY (AVERAGE 4 - 5 DAYS).
PLEASE ADD £7.00 FOR NEXT WEEKDAY DELIVERY.
GOODS USUALLY SENT OUT THE SAME DAY WHEN
CLEARED PAYMENT IS RECEIVED BEFORE 2PM.
PERSONAL CHEQUES REQUIRE 7 DAY CLEARANCE.

All prices include 17.5% VAT and free UK delivery unless stated otherwise. All prices / specifications / special offers subject to change without notice.

BEST PRICES MAIL ORDER - OUR TELESALES LINES ARE OPEN FROM 10.00AM TILL 12 MIDNIGHT - 7 DAYS A WEEK



Casio's CT-470 is a programmable, 12 note polyphonic, multi-timbral synth which has 220 preset sounds, features built-in accompaniment and rhythm sequencing facilities and has an integral amplifier and speakers. It costs around £200, and is ideal for a beginner's MIDI system.

NEW SERIES

MIDI revealed

Paul Overaa presents part one of a comprehensive series on MIDI – what it is and how you can use it

Right from issue one, many of you have been asking *Amiga Shopper* for help with MIDI and music matters. More to the point, you've been asking for a beginner's guide aimed at helping newcomers break into the world of MIDI on the Amiga.

For my sins this job has fallen to me but, having said that, this may not be such a bad thing: I've been working with MIDI almost since its inception (in the early 80s) and, better than that, I've done a lot of my MIDI work using the Commodore Amiga. That includes both reviewing and using vast amounts of Amiga MIDI software and writing my own MIDI utilities.

I have also been using MIDI sequencers (including Amiga sequencers) in a professional capacity both in the studio and when playing live, so I can hopefully throw some light on the practical issues as well as tackling the technical stuff.

Luckily I'm now fully MIDI literate and have almost a decade of MIDI work under my belt. This, however, wasn't always so, and I still remember very clearly the difficulties I had in the early days, and the questions that I couldn't get answers to. At that time there were few people around who could provide in-depth info, but nowadays things have changed and it is much easier for people to come to terms with MIDI and its uses.

My job in this series is to offer some stepping stones which will help you do just that, and in doing so provide a thorough introduction to the MIDI/music arena. I'll also try to help you avoid some of the snags and pitfalls that I know exist.



"I learned about MIDI through trial and error. By reading this series you should find learning about the subject somewhat easier than I did!"

Paul Overaa

SETTING THE SCENE

Everyone knows about the problems that either a lack of standards or a proliferation of non-identical standards can cause. With the early video era we had the format confusion (VHS, Beta, Philips 2000 and so on). Floppy disks going from 8-inch to 5.25-inch to 3.5-inch, coupled with the adoption of many different and incompatible formatting schemes, was another nasty we could all have done without.

Now, if you think that the above examples were troublesome, you should have seen what was happening in the music business 10 to 20 years ago. Synthesisers – electronic keyboards with oscillator and sound circuits that could both generate and modify complex sound waveforms, thus mimicking other instruments as well as creating their own special sounds – were beginning to appear. That in itself was great, but incompatibilities between different units spoiled things. Manufacturers would set their own standards for such things as oscillator control voltages, and a direct consequence of this was that linking equipment from different manufacturers together was usually a nightmare. When electronic drum machines came on to the scene the situation got even worse, because many of the manufacturers chose to adopt different 'standards' for their timing signals.

The real problem was not that any of the manufacturers had chosen 'bad' standards, it was just that they had all chosen different ones, and each manufacturer's standards were only coherent within the realms of their own products. From the end-user musicians' viewpoint this situation was hopeless, because they ended up becoming 'locked' into one particular range of equipment just to get some level of compatibility.

The compatibility issues were seen as a threat to what was expected to become, and in hindsight has become, a major consumer industry. After all, would you nowadays buy a video recorder that had to have a special tape format that was only available from the manufacturer of that recorder? Of course you wouldn't!

The early musicians using synthesisers, drum machines and the like were taking the brunt of the compatibility problem, and it didn't take too long before the manufacturers realised that something was going to have to be done. Some real effort needed to be put into finding a workable, and cost-effective, solution. Within a relatively

continued on page 114

BEGINNERS — **BEGINNERS START HERE** — **BEGINNERS**

What is MIDI?

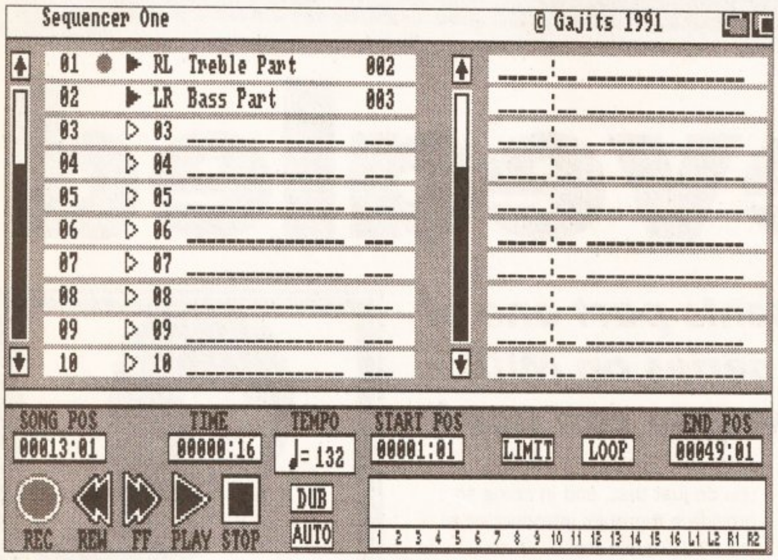
From a purely technical viewpoint, MIDI is a communications scheme which has been designed to allow standardised messages to be passed between pieces of musical equipment (synthesisers, drum machines and so on). What this means in practice, however, is that MIDI allows you to connect together all sorts of different pieces of musical equipment (from any number of manufacturers) and, provided that a few ground rules are followed, they will all work together quite happily.

That in itself is quite an achievement, but MIDI has done far more than this: It has allowed computers to be used to read, store, edit and replay those messages (acting like a digital message tape-recorder) and this has led to a development which has turned the music world upside down... I'm talking here about the MIDI sequencer.

Not only has sequencing made life easier for the competent musician, but it has opened the doors for everyone else. It is no exageration to say that the sequencer has made it possible for anyone with the slightest ear for music to play things that sound good without having to spend years mastering a musical instrument. In many ways then, the sequencer is to the music world what the word processor is to business.

continued from page 113

short time span some of the major manufacturers of electronic music equipment from the States, Germany, Japan, the UK and a number of other countries got together to produce a framework which aimed to allow all types of equipment to use a common communications protocol.



Gajits' ***Sequencer One*** **is a nice, easy to use program that performs well.**

The initial ideas, and experimental trials, all seemed to revolve around relatively straightforward instrument-to-instrument links similar to those already in use by companies like Sequential Circuits. Such ideas were quickly replaced, however, quite possibly because of pressure from the high-tech Japanese companies, and a far more adventurous scheme developed which involved a fast serial transfer based on optically isolated, twisted-pair cable links. The cables would be used to transmit digital data using a well-defined, but flexible, multi-byte message protocol. The messages would cover musical note information, dynamics (measuring how hard keys were being pressed), internal voice (sound circuitry) selection and a great many other things besides. The system would also cater directly for the simultaneous control of many different instruments. The designers even gave it a name: the 'Musical Instrument Digital Interface', nowadays more commonly referred to as MIDI.

MIDI PRELIMINARIES

I'm not going to start this series by giving you loads of technical info, because it serves little purpose. Having said that, some general info will help. MIDI, as I've already mentioned, is a serial communications standard and MIDI messages are sent as streams of pulses (much like the data that is passed through a printer cable). Each eight bit 'byte' is sent with a start bit and a stop bit at a speed of 31.25 kilobaud. That's about one byte of MIDI information every 320 millionths of a second.

MIDI equipment usually has two or three five-pin DIN sockets. The terminal marked MIDI-IN is where the equipment receives its MIDI data, and the one marked MIDI-OUT is where data is transmitted. Often you'll also find a MIDI-THRU socket; this provides a duplicate of whatever is being received at the MIDI-IN terminal. Not all types of equipment will understand all types of messages, and nor does every piece of MIDI equipment send every type of message, but this doesn't usually cause much in the way of problems – provided you know what types of messages your own particular equipment is capable of sending and understanding.

POINTS TO NOTE

There are a couple of general things that are worth mentioning at this point because they've been known to cause confusion...

First, MIDI sends its information in 8-bit units. As you'll no doubt know, the computer world calls these 'bytes' and a byte can represent a letter, a number or anything else – as long as it can be coded as one of the 256 patterns which an 8-bit binary number can represent. MIDI messages, then, are sent as streams of 8-bit numbers and it is the MIDI standard which has defined their meaning.

And there's more: some of these MIDI messages can consist of more than one byte. The first byte, known as a 'status byte', acts as a message identifier and enables the receiving equipment to determine what type of message is coming in. Subsequent bytes of the message, if indeed they exist, are known as 'data bytes'.

How does MIDI distinguish between status bytes and data bytes? Well, the designers opted for using the uppermost bit of each byte as a flag. Status bytes always have the high bit (bit 7) set, so these numbers can range from 10000000 binary to 11111111 binary (decimal 128 to decimal 255). Because bit 7 is effectively used as a status byte indicator, all data bytes are restricted to values ranging from 00000000 binary to 01111111 binary (decimal 0 to decimal 127).

MIDI recognises the existence of 16 separate channels and a large class of MIDI messages, known as 'channel messages', contain a channel number encoded within the status byte of the message. Pieces of equipment can therefore be selective about the messages they make use of and the result is that it is possible to have many different devices all attached to each other via a single MIDI communications cable loop. By setting up each unit to respond to a different MIDI channel, all of the MIDI messages can be sent down the same set of cables with each unit responding to only those messages that have the matching channel number identification. It's a little like someone writing a letter to you, sticking it in an addressed envelope and posting it – the letter, along with thousands of others, gets carried around the postal system but, as far as reading the contents goes, it is essentially ignored until it arrives at your front door – its final destination. You know the letter is for you because it has got your name and address on it; MIDI units know when a channel message has arrived for them because it will have a suitable channel number built into the message's status byte.

MIDI at the highest level distinguishes between the channel messages just mentioned and messages of more general interest to the system. All of this will be dealt with in the fullness of time, but for now we have more pressing things to discuss. Namely, what you need to get started in terms of equipment...

WHAT YOU'LL NEED

Assuming you already have an Amiga you'll need three other main items: a MIDI interface, a synthesiser and a sequencer program. You are also likely to need a couple of suitable connecting leads, usually called MIDI leads. You can make these yourself, but since they can be bought for a few pounds from your local music shop there is little to be gained financially from doing so.

The MIDI interface: you'll find quite an array of these at your local Amiga dealers and in magazine adverts. A MIDI interface for an Amiga is quite a simple affair which plugs into the Amiga's serial port. Its basic purpose is to provide suitable signal characteristics, the signal opto-isolation and, most important of all, the right physical connections (a MIDI-IN, a MIDI-OUT and usually a MIDI-THRU DIN connector).

MIDI interfaces cost from around £20 up to over £100, depending on the facilities provided. Omega Projects (who can be reached on 0925 763946), for instance, market a nice little A500/A2000 interface which is built into a D connector and costs only £19.95. It plugs into the Amiga's serial port and comes complete with two leads which can plug directly into the MIDI gear (so you will not need extra MIDI cables).

Some interfaces, including the one mentioned above, contain LED indicators which flash when MIDI data is being transmitted. The LED indicators are by no means

continued on page 116

JARGON BUSTING

Baud – A standard scale for expressing the speed of serial data transmission. One baud is roughly equivalent to one byte per second.

DIN connector – A standard plug/socket system found in many pieces of audio equipment (cassette tape machines, for instance, will usually have some DIN connectors on the back-panel).

Drum machine – A programmable electronic unit which makes drum sounds.

Kilobaud – 1,000 baud.

Optically isolated – If a device is optically isolated, light-sensitive devices are used to allow information to pass whilst not allowing electrical current to flow.

Oscillator circuit – An electronic circuit, which can be used to generate musical tones.

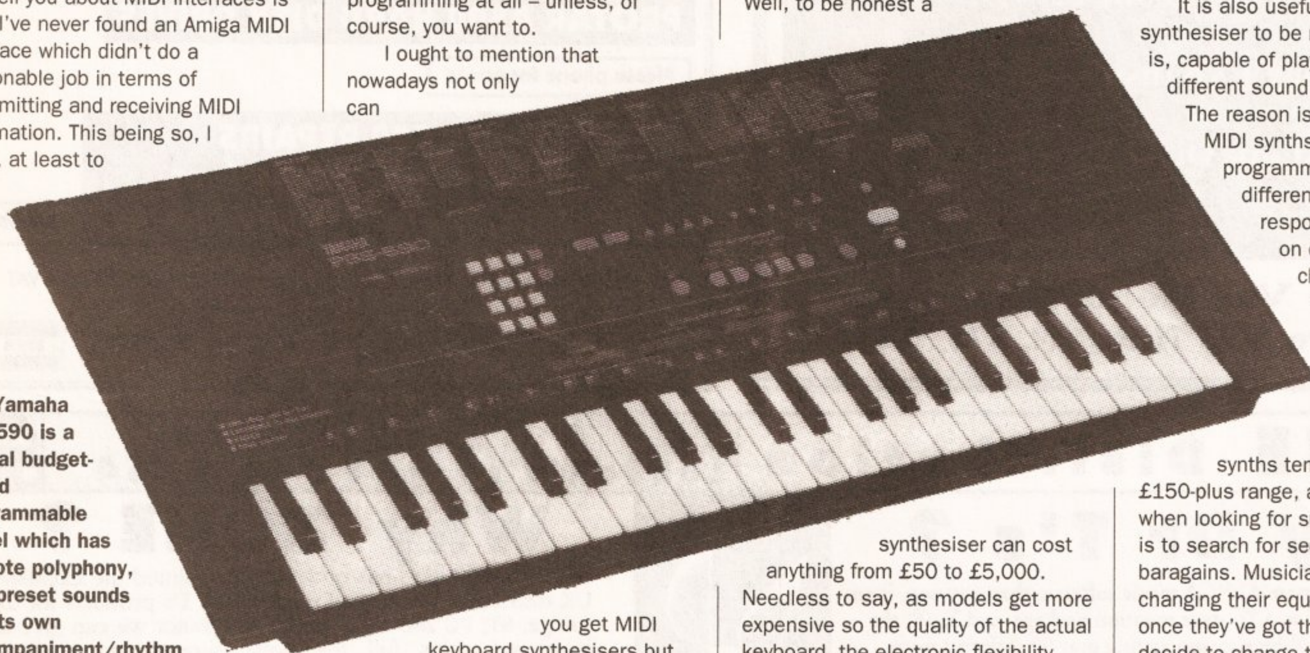
Serial transfer – This is a method of sending information as a stream of bits sent one after the other.

continued from page 114

essential, but they can help with fault-finding and are therefore a useful extra.

The more expensive models may have several MIDI-OUT terminals and extra switch facilities – this can become useful when you start adding more equipment to your MIDI setup, but it is really not necessary in the early stages. Similarly, some of the more expensive interfaces designed for the Amiga A2000-type machines will allow the interface to be fitted internally, thus putting the MIDI terminals on the back panel of the computer. This arrangement is useful for the serious user because it eliminates the need for a separate interface box – but, of course, it is a convenience which you pay for!

I think the most useful thing I can tell you about MIDI interfaces is this: I've never found an Amiga MIDI interface which didn't do a reasonable job in terms of transmitting and receiving MIDI information. This being so, I think, at least to start with, that there is little or no reason not to use cheapness as the main criteria for deciding which unit you should buy.



The Yamaha PSS-590 is a typical budget-priced programmable model which has 28 note polyphony, 100 preset sounds and its own accompaniment/rhythm sequencing facilities and a built-in amp and speakers. It costs about £150.

The Synthesiser: The second thing you'll need is some kind of synthesiser, and in case you've never seen or heard one a few words are in order. Synthesisers are electronic 'instruments' which can create sounds by generating complex sound waveforms. They can not only be used to invent new sounds, but can be used to mimic other instruments like violins, pianos and drums. They can even duplicate sounds like plates smashing, a person whistling or a helicopter taking off. Synthesisers can change from one sound to another very quickly nowadays – one moment your keyboard can be sounding like a violin string section, and the next it could be imitating an oboe, a cello or a harmonica. The MIDI standard contains one particular class of message which let this 'voice' changing be carried out automatically, without you having to physically alter any controls on the synthesiser.

The snag is, or rather the snag used to be, that these clever synthesisers had to be 'programmed' to get the right noises out of them. This, if you were new to such things, turned out to be a difficult and time-consuming job. Luckily, all synthesisers which are on the market nowadays include a collection of pre-programmed voices (called 'presets'). These sounds are available from the moment you switch on, so you will not need to worry about synthesiser voice programming at all – unless, of course, you want to.

I ought to mention that nowadays not only can you get MIDI keyboard synthesisers but also MIDI guitars, MIDI wind instrument sensors, MIDI drum pads and a host of other 'MIDI input' devices. Most people, however, whether they are keyboard players or not, tend to start with – and continue to use – keyboards for the bulk of their MIDI work. This being so, most people who are working with MIDI tend, to a greater or lesser extent, to become 'keyboard literate'. Basically you need to learn to find your way around a piano-style keyboard. What may surprise you is that you definitely do not, by any stretch of the imagination, need to become a technically competent keyboard player. There is a very good reason why a keyboard synthesiser is the best 'first instrument' from the beginner's viewpoint: most budget synthesisers (and many more expensive keyboard synthesisers come to that) contain built-in sound circuitry. In effect you are buying the keyboard (which is the MIDI input device) and some in-built synthesiser sound circuitry.

The sound circuitry serves two purposes: first, it is used to create sounds when you press keys on the keyboard. Secondly, the sound circuits can be 'played' by sending MIDI data into the synthesiser via the MIDI-IN socket. Incidentally, it is possible nowadays to get keyboards without any sound circuitry, and to get MIDI-controlled sound modules which are just the synthesiser sound circuitry without the keyboard hardware. The benefit here is flexibility – you can use a single keyboard with many different sound modules, you can change a module without having to change the keyboard and so on. (I'll have a look at the benefits of this type of system later in the series.)

So, you are no doubt asking how much is all this gear going to cost. Well, to be honest a synthesiser can cost anything from £50 to £5,000. Needless to say, as models get more expensive so the quality of the actual keyboard, the electronic flexibility and the sounds they make all get better and better. What does surprise many people is just how good even the cheapest models can sound; the established manufacturers like Casio and Yamaha, for instance, produce some excellent budget ranges.

One thing you will not get with a budget synthesiser will be a touch-sensitive keyboard – that is, a keyboard which can sense how hard you press the keys and adjust the volume of the sounds accordingly. Notes will be either on or off (sounding or not sounding) and that, unless you've got lots of money, is something that you'll have to learn to live with. Unless you are already an experienced keyboard player you are unlikely to worry too much about the difference anyway.

Synthesisers built for serious use, incidentally, do not have any internal speakers, so you have to connect them to a separate amplifier/speaker system. Having said that, many budget synths (such as the Casio and Yamaha units we've shown as examples) nowadays do have a small amplifier and speaker built in to them. If this is not the case then for home, low-volume use you should be able to avoid further expense by plugging the synth into your hi-fi system.

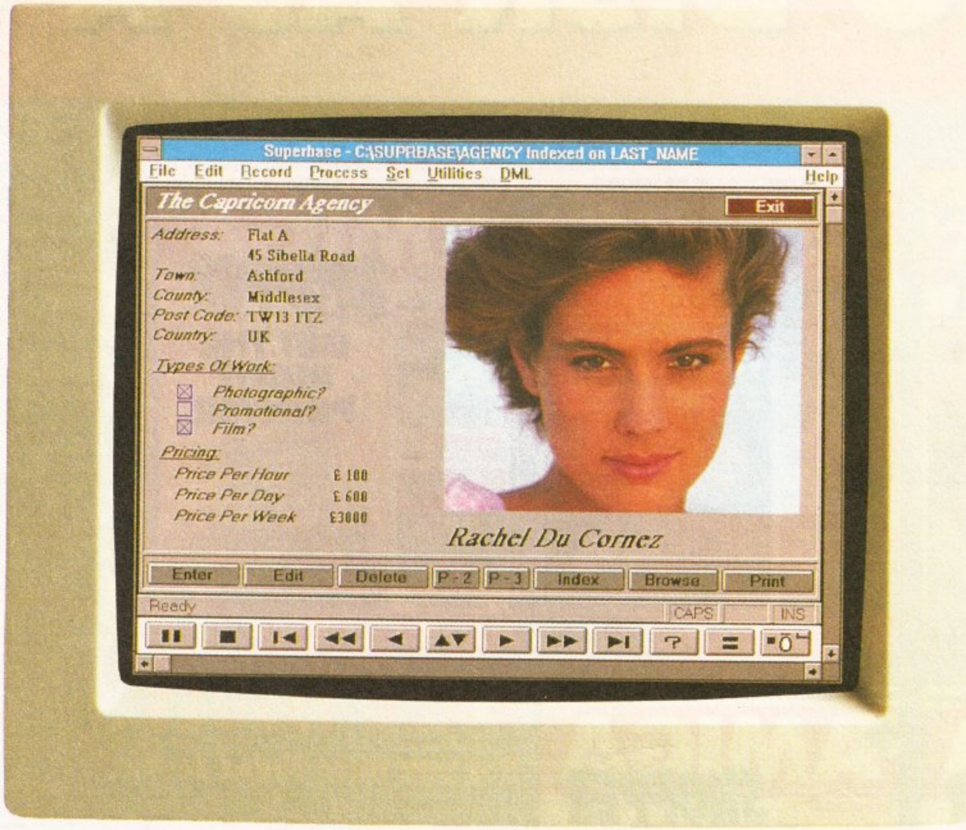
For MIDI work, synthesisers need to be polyphonic – that is, able to play many notes at the same time. I'd say that eight note polyphony (the ability to play up to eight notes simultaneously) ought to be regarded as the minimum, and I'm mentioning this because some very cheap models – even though they are modern MIDI synthesisers – may only offer two or four note polyphonic operation. Quite simply, you'll find these synths limiting right from the start so it is best to avoid them.

It is also useful for the synthesiser to be multi-timbral – that is, capable of playing more than one different sound at the same time. The reason is that multi-timbral MIDI synths can usually be programmed so that different 'voices' (sounds) respond to information on different MIDI channels. This, as we'll see later in the series, is a very useful facility to have.

Multi-timbral synths tend to fall into the £150-plus range, and one possibility when looking for such synthesisers is to search for second-hand baragains. Musicians are always changing their equipment and many, once they've got the MIDI bug, will decide to change their original synthesisers for more versatile (and more expensive) models. This means that there is always a steady stream of 'for sale' adverts in the music magazines and local papers (often you'll find units at around half the price of the corresponding new model). It's an option worth thinking about if you want to keep initial costs to a minimum.

The Sequencer: Amiga sequencers can cost anywwhere between £40 and £400, and nowadays there are quite a few to choose from. The Disk Company's *Harmoni* sequencer is reasonably priced at £49.95, and is more than adequate for the beginner. Gajits' *Sequencer One* is another particularly good offering and although it costs slightly more (£89.99) it is a worthwhile investment if you can afford the extra. There is public domain MIDI software floating around, I've never seen anything that I can truthfully say I'd be happy to recommend.

continued on page 121



If your database looks like this, you're ready to face the future.

Given the chance to gaze at the future of database computing, what would you see?

Graphical applications that are intuitive and yet incredibly powerful, supporting sound samples and even pictures.

Applications like Superbase 4 Amiga.



Unique features like the VCR panel mean browsing and reporting on data have never been simpler.

Superbase's WYSIWYG Form Designer lets you draw and design forms that are easy to understand and use.

And, with its own comprehensive Database Management Language, you can develop professional applications.

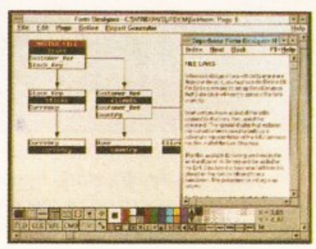
You can share data with users of IBM-compatible PCs, while developers can make sophisticated database solutions available on both Amiga and Microsoft Windows platforms.



All trademarks acknowledged. Screen shot taken on an IBM PC.

Superbase 4 Amiga also supports import/export of dBase, Lotus 1-2-3 and Microsoft Excel files.

So, for your future's sake, clip the coupon, send us your business card or call us on **081 330 7166** to find out more about Superbase 4 Amiga. After all, the benefits are staring you in the face.



Denote the relational links between the files referenced in your form.

SUPERBASE® PROFESSIONAL 4

I currently own a copy of:

☐ Superbase Professional ☐ Superbase Personal 2
☐ Superbase Personal ☐ Neither

Name ______________________ Job Title ______________

Company ______________________________________

Address ______________________________________

____

Postcode ________________ Tel ___________________

Precision Software Ltd. 6 Park Terrace, Worcester Park, Surrey KT4 7JZ.
Tel: 081 330 7166 Fax: 081 330 2089

DEMO DISK AS A GIFT











2 Buying a paint package plus reviews of Pagestream, Colourpic, Sequencer 1, KCS Powerboard, and Scala

3 Accelerating the Amiga plus reviews of Bars & Pipes, Daatascan, ATonce, DynaCADD and Basic languages

4 Buying a printer plus reviews of Pro-24, Real 3D, Wordworth, TEX, Imagine and Superbase 4

5 Amiga Answers special plus reviews of Spectracolor, Superbase 4, Touch-Up, Action Replay, VideoCenter Plus and more

6 The most comprehensive review ever of Amiga word processors, plus the Video Toaster and a free fractals guide

BACK ISSUES

Did you miss these Issues?

Issue 1 is already sold out, so grab the rest while they're still available. Use the form opposite to claim your back issues of Amiga Shopper.

£1.50 each including post and packing.

Don't miss any more!

Whilst you are sending off for these issues doesn't it makes sense to subscribe now so you don't miss any more bargains? For just £11.98 you will get the next 12 issues delivered direct to your home plus a special sampler disk – a gift with our compliments.

You know it makes sense. Do it now.

If you wish you can purchase demo disks 1, 2 and 3 separately for just £1.75 each

Use the order form opposite and please make sure you indicate which demo disks you require.

DISK 1

Contains demos of *AMOS* from Mandarin – the programming language that took the Amiga world by storm, *Devpac* 2 from HiSoft – the assembler that's used by the professionals, *RealThings* from RGB Studios – it brings things to life in *Deluxe Paint III* and lets you design, build and fly your own butterfly.

DISK 2

WORDWORTH This brand new word processor from Digita International is described by the company as 'a writer's dream' and you'll be able to see if it is for yourself with this demo. You will also get a voucher enabling you to buy *Wordworth* for just £99.95 – that's a saving of £30 on it's normal price!

SEQUENCER ONE In issue 2 of *Amiga Shopper* we said of this new sequencing program from Gajits Music Software "it has to be *the* budget priced sequencing software for the Amiga." Why not find out for yourself and take advantage of our special voucher offer to obtain a free disk of exciting new samples for use with *Sequencer One*?

3D CONSTRUCTION KIT If you've ever wanted to create your own 3-dimensional worlds then now is your chance with Domark/Incentive's brand new game creation program. It allows you to use Incentive's famous Freescape programming system to create your own stunning 3D games – without a scrap of programming knowledge. Don't be fooled though, this is a utility that will put great programming power at your fingertips.

Keep your copies of Amiga Shopper safe and protected – right from the very start!



Only £4.95 EACH

Use the form opposite to place your order.

WHEN YOU SUBSCRIBE

Subscribe and get 12 issues of Amiga Shopper delivered to your door for just £11.98 PLUS you will also receive demo disk No.3 as a gift!

SUPERB DEMO DISK

When you subscribe to *Amiga Shopper* you not only get 12 issues of the most useful Amiga magazine delivered straight to your door, but also disk No.3 containing demos of new software to help you make your buying decisions. This packed disk contains superb demos of:

DISK 3

Spectracolor: The new entry into the HAM painting arena looks set to upset the applecart. Try its 4,096 colours and animation facilities out for yourself with the demo version. You can wrap brushes on to three dimensional objects, and try out the rub-through effect for blending two images.

Superbase Professional 4: You have read a lot about the Amiga's premier database, and now here's your chance to try it out for yourself. Superbase is a fully relational system with its own programming language, and with it you can set up a database for any purpose you like. It can even handle graphics as well as numbers and text.

Just look at all the benefits that you get when you subscribe

- **You save time**
- **You save trouble**
- **You guarantee your copy**
- **You get it delivered**
- **You receive a superb demo disk – as a gift**

All this for just £11.98!!

Don't run the risk of missing the latest news, expert advice and best buys for your Amiga. Complete the coupon below and return it now or call our credit card hotline on 0458 74011

YES, YES, YES! I WISH TO BECOME A SUBSCRIBER TO AMIGA SHOPPER. PLEASE SEND ME THE NEXT 12 ISSUES AND THE SPECIAL SAMPLER DISK NO 3.

Please tick the subscription you require ☐ **UK** £11.98 ☐ **EUROPE** £30.23 (Airmail) ☐ **REST OF WORLD** £47.28 (Airmail) ☐ **WORLD** £24.58 (surface)

Please also send me *please tick*

BACK ISSUES £1.50 EACH ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 **SAMPLER DISK** £1.75 EACH ☐ 1 ☐ 2 ☐ 3 **BINDER** £4.95 ☐ Total amount payable £☐☐.☐☐

NAME ______________________ TELEPHONE NO ______________________

ADDRESS ______________________

______________________ POST CODE ______________________

METHOD OF PAYMENT *please tick*

☐ **VISA/ACCESS** CARD NO ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ ☐☐☐☐ EXPIRY DATE ☐☐ ☐☐

☐ **CHEQUE** Please make cheques payable to FUTURE PUBLISHING LTD and send together with this card in an envelope to the following address: AMIGA SHOPPER, FREEPOST, SOMERTON TA11 7BR

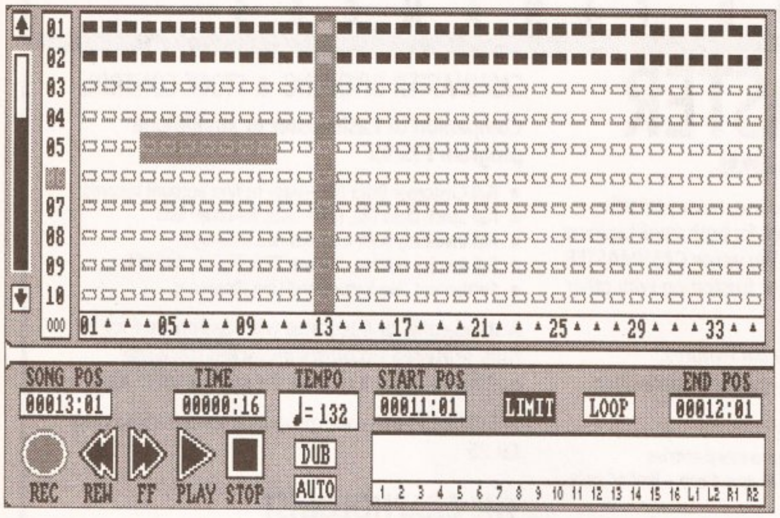
NB. THIS OFFER CLOSES ON 31ST NOVEMBER 1991 **AS/MAG/1191**

continued from page 116

I use Dr T's *KCS* and *Bars & Pipes Professional* for my serious MIDI work but these are expensive, heavyweight, packages which are best considered only after you have some MIDI expertise under your belt and can appreciate their versatility. I'll talk more about the heavweight options towards the end of the series, but for the moment I wouldn't suggest diving in and buying a top-end sequencer program. Aim for one of the simpler packages because you'll find them easier to use.

Irrespective of cost, all sequencers offer a set of core facilities that will allow you to record MIDI data from your synthesiser and play it back. They will also provide a mass of editing options that let you copy sections of music, transpose (change the key), add notes, delete notes and so on. If your timing was a bit wrong you can even ask the sequencer to correct ('quantise') the timing of the notes for you.

All of this can seem like magic, so it's worth spending a bit of time seeing exactly what goes on inside a sequencer program and seeing how things like key changing and quantising relates to the messages transmitted by a synthesiser. As you now know, the things which make message transmission possible are the MIDI terminals that we've talked about. These terminals transmit and receive MIDI messages and it is



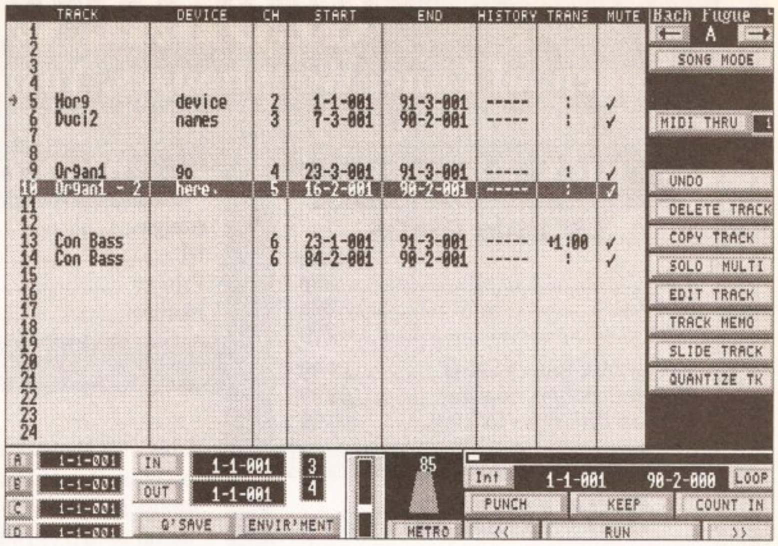
All sequencers have the facility to edit data once it has been entered.

these messages which sequencers use to collect the information about what you are playing.

When do these numbers get transmitted? It's usually when you do something: touch a control knob, press a key on a keyboard or whatever. If, for instance, you press the START button on a Yamaha RX11 drum machine then a 'start' message (actually the number '250') will be transmitted, followed by numbers which represent the drum notes, durations and so on. On a synthesiser, streams of numbers which represent such things as the notes being played, and controller information, will be transmitted from the MIDI-OUT terminal. Other types of MIDI equipment send similar streams of numbers and because the meanings of the numbers are standardised one piece of MIDI equipment is able to understand another piece of equipment's messages. To get one unit to 'talk' to another you simply use a MIDI lead to connect them together using the appropriate MIDI-IN and MIDI-OUT terminals.

When you connect a sequencer into a MIDI system it is able to 'read' all of the MIDI messages and record what is going on as you play. Sequencers are not interested in the sounds being made, it's the MIDI messages that hold the magic key. Sequencers come in two basic forms: the dedicated units, and those based on computer programs which can be loaded into any suitable computer (like the Amiga's Dr T *KCS* package). All sequencers are computer-based, and at the end of the day both dedicated units and software-based sequencer packages will use a microprocessor chip to store and manipulate the MIDI data which you (the user) will provide.

When you hit a note on a synthesiser keyboard three pieces of MIDI data actually get transmitted: a status byte which says 'here comes a message about a note being hit', a number representing the particular note in question, and lastly a number which indicates how hard the note was hit (non touch-sensitive keyboards transmit the fixed value 64 here). The status byte includes details of which MIDI channel is being used, so after a sequencer has read these three pieces of data it will know first that you've hit a note on the keyboard, secondly which MIDI channel you're using, thirdly which note you hit and lastly how loud the



The Disk Company's *Harmoni* sequencer is fairly cheap (about £50) and is more than adequate for the beginner.

sound should be (how hard you hit the key).

This type of information gets stored initially in the computer's memory – usually as a simple list of events. A bit more information needs to be added before the sequencer can make use of this data: it needs to know something about the time between various events (otherwise it wouldn't be able to play them back in the right way). Sequencers can usually do several things here: they can use their own 'clock' to keep track of the time between events, or they can read an external MIDI clock which you, the user, must provide. A MIDI clock is a MIDI message whose sole purpose is to create a 'system time' which can be read and intepreted by connected equipment.

So, one way or the other the sequencer can recognise the time interval between the various MIDI events which are occurring, and it is therefore able to 'time stamp' each of the events. This means that the computer not only knows that you have pressed a note on the keyboard, but it has kept a record of when you did it.

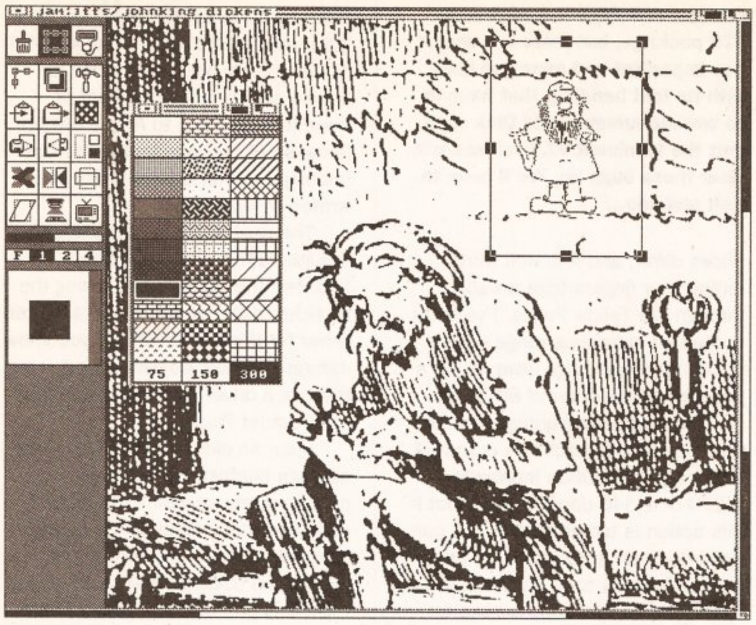
This pattern of events occurs for all of the MIDI messages which are received, and at the end of the day the sequencer will have built a list of all the messages and details of the times at which they occurred. To replay such a sequence, all that the sequencer needs to do is read through this list of events and play back each of them at the right time. To increase the tempo it can play the events back faster, to decrease the tempo it does the opposite. Because all of the event information is in numerical form, it's easy to modify – to transpose a sequence upwards by one semitone it will just add 1 to each note value, to transpose downwards by an octave it will subtract 12 from each note number; it's as simple as that!

Duplication is just as easy: to copy a section of MIDI data, the sequencer will read the part of its memory which holds the necessary information, and copy it to another area of its memory. To quantise a list of events it will read all of the time stamps and round them up or down to fit in with whatever quantise value you've selected.

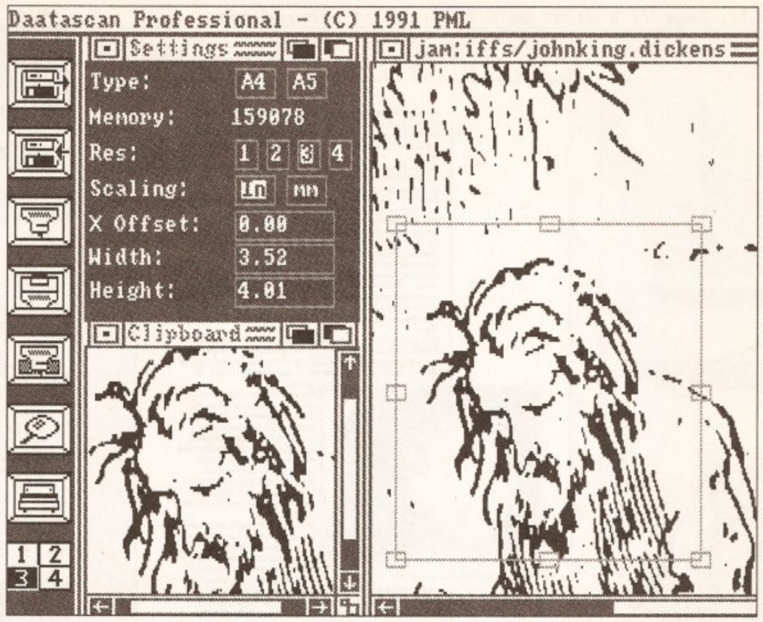
Tracks, sequences, complete songs and so on are all handled in the same sort of way, and although specific details of the internal formats used do vary, the basic ideas are essentially the same. Sequencers work with numbers – reading, manipulating, storing and transmitting them according to pre-defined rules. For the sequencer at least, the world of MIDI is a silent world of addition, subtraction and event manipulation – not that far removed from the operations of a sophisticated calculator!

CONNECTING UP

In terms of linking together a three piece 'Amiga sequencer, synthesiser, MIDI interface' MIDI system there's really nothing to it. Connect your MIDI interface to the Amiga's serial port D connector. Take one MIDI lead from the MIDI-OUT of the synthesiser to the MIDI-IN of the MIDI interface (this will be the lead that carries data from the synthesiser to the sequencer program). Connect a second cable from the MIDI-OUT of the MIDI interface to the MIDI-IN terminal of the synthesiser (it is down this lead that the sequencer will send information to the synthesiser). Switch on, load your sequencer program according to the instructions given in the sequencer manual, and you'll be home and dry. The sequencer program will be sitting there waiting for you to do something. Experiments in this area, however, are going to have to wait until next month... AS



While the Golden Image hand scanner and *Touch-Up* software (above) is certainly the best hand scanner package currently available for the Amiga...



...non-arty people may find the *Datascan Professional* software (above) that comes with the Pandaal hand scanner easier to use.

DIY DTP

Jeff Walker discusses the cost and the kit required to set up a professional Amiga desktop publishing workstation



"I produce a monthly magazine using an Amiga; this month I'm looking at what you need to do something similar."

Jeff Walker

Since we launched *Amiga Shopper*, I've received a lot of letters from readers wanting to set up professional desktop publishing systems based around their Amigas. The bottom line of all these letters has been: "what do I need and how much will it cost?"

Short question, long answer. But here we go...

First let's sort out the most expensive bits – the hardware requirements. A standard Amiga 500 is not good enough, and neither is a standard A1500 or 2000.

Memory is the first problem. For DTP you need lots of it – the more the better, but a minimum of 3Mb. And at least 1Mb of that must be graphics (Chip) memory because while every Amiga DTP package will quite happily run with only 512K of graphics memory, when you start to push the software hard by using multi-page documents, large text sizes and lots of ILBM pictures and structured drawings the software is either going to crash or politely tell you that it has run out of RAM. It will matter not that you have a zillion megabytes of expansion (Fast) memory free, the lifeblood of DTP software is graphics memory.

The Amiga 1500 and 2000 come with 1Mb of graphics memory as standard. All except the most recent Amiga 500s needs a Fatter Agnus chip to be fitted and some changes made to the motherboard to allow it to have 1Mb of graphics memory. You will need to contact an Amiga dealer to make these changes for you yourself is not advisable!

Expansion memory is simple. For the Amiga 1500/2000 buy an expansion card with at least 2Mb on it. You'll almost certainly need more, but you can buy and fit more RAM chips later as you need them.

For the Amiga 500, the choice is just as clear cut. You need a hard drive for serious desktop publishing, so buy a hard drive that has room inside it for RAM chips. Bear in mind that although 2Mb seems like a lot, it will quickly get used up. To avoid frustration at a later date I would recommend a hard drive that will let you expand memory up to 8Mb as and when you need it.

Similarly, while 20Mb is a lot of storage space, remember that even a two-page document can take up 200K or more, so 100 of these documents would fill the entire hard disk. I suggest that after you've added up the cost of the other bits and pieces you need to set up your desktop publishing system, you should go for the largest capacity hard drive that your budget can then stand. Don't forget that it's possible to chain hard drives together in order to increase storage capacity, so if you start with (say) an initial 40Mb, there's nothing to stop you adding another 40Mb or whatever later. Look for SCSI (pronounced 'scuzzy') drives if you think you might want to add more hard drives in the future.

The speed of the drive won't be as important to you as how big it is; a slower hard drive will take perhaps five seconds to load a large program, a faster one two seconds or less.

OUTPUT

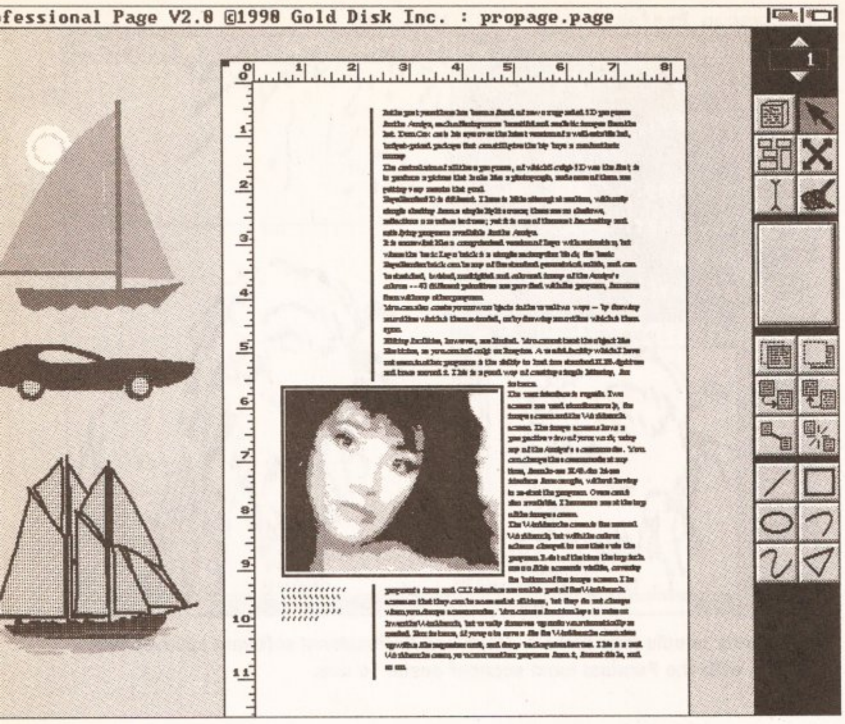
Before you rush out and buy a printer you need to decide what you are going to do with the output. Are you going to output all the copies directly from the printer? Are you going to output one copy and photocopy it s number of times? Or are you going to output one copy and send it to a printing firm for reproduction? And what about colour?

One thing is certain: using the printer as a mass production device is going to take forever, so you can forget that for a start.

Using the other two methods, we refer to our single copy (of the page or whole document) as our 'camera-ready artwork' or just 'artwork' for short. Photocopying is fine for short print runs, although the reproduction quality will entirely depend upon the quality of the photocopier and the expertise of the person operating it. Halftones, which are any graphics that contain colour or shades of grey (photographs, for instance, or digitised pictures) do not, on the whole, photocopy well. And for anything over about 500 copies, photocopying becomes more expensive than proper reproduction (printing), so let's assume that you are intending to send your artwork to a printing firm for output.

For monochrome reproduction, the printing firm will photograph your artwork and then make either a metal or a paper 'plate' from the negative. This is what is actually used to print from. The metal plate is

continued on page 124



***Professional Page* is a rock-solid DTP package, but there are one or two important and annoying bugs with its font handling that have to be worked around. Gold Disk says that the imminent v2.1 release will clear these bugs up. We'll have to wait and see...**

continued from page 123

more expensive, because of the cost of materials and time involved, but the results are sharper. Metal plates have to be used if you are reproducing on to shiny art paper (like the cover of this magazine, only a bit thinner). On the other hand, if you are printing on to normal 'bond' paper (like that used in a photocopier) and you don't have much in the way of halftones, then paper plates are fine – although they do tend to wear out much faster than metal plates – typically after only one or two thousand copies.

But with bond paper – and here we get to the crux of all this reproduction talk – the end results will suffer by differing degrees from the dreaded ink spread, or 'dot gain', a problem whereby the ink from the printing press seeps a little way along the tiny fibres of the paper, filling or part-filling any small white holes in the artwork (like the patterns in halftones) and causing tiny spidery lines to radiate from any areas of black. None of this is particularly visible to the untrained eye, but the overall effect is 'fuzzy'. The lower the resolution of the original artwork, the fuzzier the results will be.

What you have to strive for in your artwork is sharpness and blackness. You don't want to give the printers artwork that is already suffering from ink spread, and you don't want to give the printers artwork that is so faint that they have to adjust the exposure to get a good negative – poorly defined text will have to be exposed differently to 'black' text; while this may blacken up any text on your pages, halftones will turn muddier and muddier, and maybe even come out close to solid black when the ink spreads after printing. On the whole, you want to be sure that text is as sharp and black as possible.

PRINTER CHOICES

You'll get the best artwork if you take or send your files to a DTP bureau, in PostScript format, and get them to output it on a typesetting machine.

Prices differ, and it is well worth letting your fingers take a walk through the Yellow Pages. I've been quoted an enormous range – from £20 for a single page down to £6 a page for a bulk order of 60 pages.

The obvious advantage here is that typesetting machines output at a very high resolution (normally 1,270 or 2,540 dots per inch) but if this option is too expensive you can get it done on a 300dpi laser printer instead for less than £1 per page. Again, you should shop around for the best prices.

If you're doing so much work that you think it would be more productive and less costly to have your own output device, then you are going to have to spend between £300 and £2,000 on it. There are three types of printer you need to consider – bubblejet, inkjet and laser.

Bubblejet and inkjet printers work on a similar principle and both are plenty good enough for most semi-professional desktop publishing needs. The cheapest is the portable Canon BJ-10e 360dpi bubblejet at a little under £300. More than 40,000 of these have been sold since its launch earlier this year, most of them (Canon says) to Amiga owners because of the excellent shareware bubblejet printer drivers which are written by Wolf Faust.

The best seller in this market, though, is the Hewlett-Packard DeskJet, the latest model being the DeskJet 500. I've not found a printer driver for this model yet – if you know different, please do write to me – but there is a driver for its predecessor, the DeskJet Plus.

I use an old Canon BJ-130 wide-carriage bubblejet to produce camera-ready artwork. (The BJ-130 has been succeeded by the BJ-330 now, and there is a cheaper A4 model, the BJ-300.) The main reason I use this printer is because I like to 'bleed' text and graphics off the edge of my artwork, and I can't do this with a DeskJet or A4 laser printer because these devices insist on a small margin all the way around so that the ink/toner doesn't spill off the paper into the machinery.

The artwork produced by the Canon bubblejet is good enough for my current needs, but the printing firm I use still makes noises at me now and then that I ought to invest in a laser printer. Why? Because the

continued on page 126

JARGON BUSTING

Art paper – Shiny, coated paper intended to carry halftone reproduction by printing from metal plates).

Artwork – Sometimes known as 'camera-ready artwork', this is any black-and-white or colour original prepared for reproduction. Known as 'mechanicals' in the USA.

Bleed – The area of illustrations, tints or ruled lines which extends beyond the trimmed edge of a printed page.

Coated paper – Paper with a surface finished with a layer of china clay to give smoothness.

Gutter – Usually the space between facing pages where the fold or binding is, but also the space between columns on a page.

Halftone – A photograph or other graphic broken up into fine dots for reproduction.

ILBM – A standard InterLeaved BitMap graphic in Interchange File Format (IFF); the type of graphic which is produced by most Amiga paint packages.

Layout – This is the arrangement of text and graphics on a page.

Line art/illustration – A graphic made up of lines and solid areas (that is, no shading).

Monochrome – Black, white, and any shade of grey in between.

Offset lithography – A process of printing from a flat surface in which the printing areas are greasy and the non-printing areas are damp. The greasy and inked image is set off from the printing plate on to a rubber 'blanket' which transfers it on to the paper. The term is usually shortened to just 'offset'.

PostScript – A system which allows your page to be output by a professional typesetter. Pager can be saved as PostScript files and later printed on PostScript printers.

Spread – A pair of facing pages. Also known as a 'double page spread', or dps for short.

Structured drawing – A type of graphic described in memory as mathematical vectors instead of a bitmap. A structured drawing has the advantage of keeping its resolution no matter how large or small it is scaled.

Tint – A grey or coloured area made up of small dots of a solid colour (or black).

continued from page 124

output would be blacker and halftones wouldn't suffer from the banding effect that any tractor- or friction-fed device produces.

But if you're thinking about a laser printer, there's not much point in going for anything less than one that understands the PostScript page description language. The main reason for this is speed – what a dot-matrix inkjet or bubblejet takes 20 minutes to produce, a PostScript laser printer can output in a tenth of the time.

And the other major reason for choosing a PostScript laser printer over any other is the dreaded printer driver problem.

The only laser printer drivers I know of for the Amiga are Hewlett-Packard ones. And these drivers don't work particularly well – the one on the Extras disk, for example, is painfully slow and restricts the printing area to an 8-inch by 10-inch area of the page. Many's the phone call I've had from people who have spent a four-figure sum on a laser printer, only to get it home and find that the Amiga won't talk to it or it won't print the bottom inch-and-a-half of their A4 page. PostScript totally rids you of this driver problem.

The cheapest PostScript laser printer I've seen costs just under £2,000. Is this within your budget? Only you can answer that.

DIVIDE AND RULE

If your needs include colour, then I hope your pockets are deep.

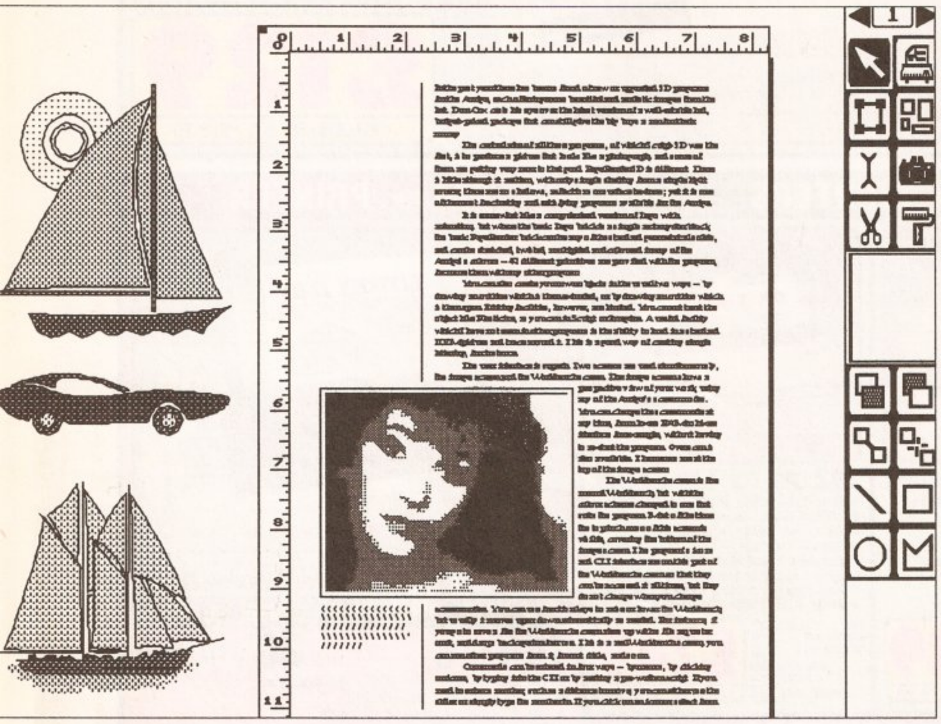
The first thing you need to understand is that you don't need a colour printer to end up with a colour page or document. What you need are 'separations' – a process whereby each of the four primary printing colours (cyan, magenta, yellow and black) on a page get printed on to separate sheets, but in black-and-white. The printing firm will photograph the sheets separately and print each separation one on top of the other, using one of the four primary inks for each separation. The end result is a full colour page.

OK, that's a very simplified description of the process, but it's all you need to know at this stage.

The point is that it's not the camera-ready artwork that is going to cost you, it's the fact that everything has to be done three or four times. Also, you really need to reproduce on to art paper (the shiny stuff), otherwise the final page or document will end up looking dreadful. Art paper is a lot more expensive than bond paper. And coloured inks are expensive too, of course.

With a PostScript laser printer you'll be able to produce your own separations – in negative, and on film, but only at 300 dots per inch – and thus reduce the overall printing bill. Again you have the cost of materials to bear in mind; the laser printer will use more toner, and there's the cost of the film for the separations. And because of the low resolution, the quality will be poor.

Unless you're producing lots of colour leaflets or magazines it's probably best to let the printing firm take the strain. It's entirely probable that they'll be able to accept PostScript files from which they will be able to produce faster and less expensive separations. Make a note to speak to them about that.



The inexpensive *PageSetter II* package only copes with black-and-white and grey levels, and there's no PostScript output or facilities to rotate text and graphics, but because it makes use of Compugraphic fonts it can produce professional-looking output to dot-matrix printers (including inkjet, bubblejet and HP-compatible laser printers) along with the best of them. The area to the left of the page is an 'art board', where work can be done before moving finished boxes on to the page. The three graphics on the art board are structured drawings, the graphic on the page is an ILBM.

Colour separation is a real art. Mistakes can be very costly. I'm not copping out when I say that it's best left to the experts. And the only way *you'll* become an expert is by reading a lot of books on the subject and by experimenting on an expensive, trial-and-error basis.

INCREASING THE POWER

You don't need a special monitor to DTP with; the standard Commodore 1084 (or equivalent) will do. Yes, I know that a multisync monitor and display enhancer will give you a rock-steady interlaced display, enabling more of a page to be seen in more detail, but there are two drawbacks. First, the screen refresh will take a lot longer in interlace mode; secondly, you've got better things to buy with the £700 (at least) that this kit will cost you. Like an accelerator board, for instance.

None of the Amiga DTP packages runs particularly quickly. If you're laying out the odd catalogue or brochure you will certainly be able to live without speed-up hardware – more memory and a hard drive should be higher on your shopping list – but for serious DTP you need more speed if you don't want to spend half the day waiting for the program to finish its tasks.

All the accelerators for the Amiga 500 fit inside the machine. You have to remove the original 68000 chip and replace it with the accelerator board, although this is not a difficult job. (Fitting an accelerator to the Amiga 1500/2000 is even simpler. Buy one that's on a card – just like the RAM expansions – open the case and slot it in.)

Now, you can say the same thing about all the kit we've discussed so far: the more you spend, the better or faster it will be. If you buy the cheapest kit you can find, for heaven's sake don't expect to end up with a top performance graphics workstation. Because that – a graphics workstation – is exactly what we are building.

There is, of course, a cheaper and quicker way to do things: don't build it, buy it ready-built. The obvious choice is the Amiga 3000 with its 2Mb of chip memory, hard drive and 68030 central processing unit (CPU), which will set you back about £3,000-£4,000 depending on which configuration you buy – the more you spend, the faster it runs, the more memory it comes with and the larger the hard drive. To turn an Amiga 500/1500/2000 into something close to the Amiga 3000 will cost you as much as – or more than – the Amiga 3000 itself.

But the Amiga 3000 isn't your only choice. Bytes & Pieces (0253 734218), for instance, sells a ready-built Amiga Graphics Workstation for £2,000. It has a separate case and keyboard (like the 1500/2000/3000) and comes fitted with a 52Mb hard drive, 4Mb of memory (2Mb graphics, 2Mb Fast), a 68030 accelerator, and an IDE display enhancer (aka flicker-fixer) which means you can hook it up to a multisync or VGA monitor if you like.

Now it isn't really the place of this article to recommend products from particular retailers, but this Bytes & Pieces Graphics Workstation is such extraordinary value that it would be wrong not to point out that if you collected all the bits and built the same thing yourself, you'd end up spending about £1,000 more.

It's not a complete DTP workstation, though, because it doesn't come with a scanner. Remember that monochrome hand scanners are not good at scanning photographs. The results are OK from an amateur or semi-professional point of view, but if your document is intended to impress, you won't get away with anything less than a 256-colour (or 256-grey level) scanner and high-resolution typesetting machine output – a 300dpi laser printer simply does not have a large enough dot-matrix to represent 256 levels of grey to

continued on page 129

RECOMMENDED READING

Design for desktop publishing
By John Miles
Published by John Taylor Book Ventures (1987).

Copy Editing
By Judith Butcher
Published by Cambridge University Press (1975).

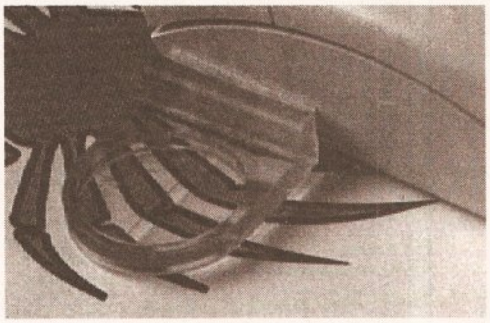
Simple! Ingenious!

TRACEY

Turn your Amiga's mouse into a digitiser – for just £7.95!

Do you want to trace photographs and sketches into your DTP or graphics package? You need Tracey! This precision-moulded transparent puck attaches to your Amiga's mouse to give a quick visual guide of what you are tracing. Fixes to either side of the mouse for left or right handed use.

★ Removable when not in use
★ Ideal for Naksha, Commodore and all flat-sided mice
★ Only £7.95 including VAT and p&p



"This novel little device makes copying pictures easy" – *Amiga Format, Nov. '90*

"If the rule that all the simplest ideas are the best is applied, then Tracey gets the prize" – *Computer Shopper, Jan '91*

Cheque with order. Trade enquiries welcome.

SideWise Ltd (Dept AS7), PO Box 4, Totnes, Devon TQ9 7EN

Swift Microcomputers Ltd.

84 High Street North, Dunstable, Bedfordshire, LU6 3HP.
Tele: (0582) 476257 Fax: (0582) 476258

3.5 DS/DD DISKS

50	£21
100	£33
250	£75
500	£135
1000	£265

3.5 DS/HD DISKS

50	£28
100	£54
250	£130

3.5 DS/DD & BOXES

50 DISKS + 80 BOX £24
100 DISKS + 80 BOX £36
200 DISKS + 2x80 BOXES £65

SONY DS/DD BULK

50 £21 100 £38
250 £95 500 £180

XMAS AMIGA DEALS!

1
A 500 Computer 1Mb Ram Extra Drive £369

2
A500 COMPUTER 1Mb RAM WITH PHILIPS CM8833 MK2 £529

PRINTERS

STAR

LC 10	£145.00
LC24 - 10	£210.00
LC 200	£209.00
LC 24 - 200	£289.00

CANON

BJ10e	£239.00

COMMODORE

CARTOON CLASSICS
£365
CLASS OF 90s
£455
CUMANA DRIVE
£59

BITS N BOBS

1.5 Meg RAM	£85
AMIGA MOUSE	£14
A590 H/DISK	£279
MONITOR STAND	£12
DUST COVERS	£5
LC10 RIBBON	£3
COLOUR	£6
10 3.6 BRANDED	£6
10 3.5 COLOURED	£7
MOUSE MAT	£3

11 x 9.5 PAPER 60gsm
500 SHEETS £9

0.5 Meg Ram
£20.99
(Add £4 for clock)

PHILIPS
CM8833 Mk2
£219

HOW TO ORDER
Visit our showroom with easy parking or send cheque or postal order to the above address. Access and Visa accepted.

PRICES INCLUDE VAT AND DELIVERY. ADD £9.00 FOR NEXT DAY DELIVERY

WeServe

of Hampshire
Best for service

Canon BJ-10e

360dpi Inkjet printer
with cable & paper
£233.83 (£199.00 + VAT)

Panasonic

KXP1180	134.00
KXP1123	185.00
KXP1124i	252.63

prices inc. VAT cable & paper

Amiga 1500

with Full software pack
£649.00 inc VAT

CBM 1084SD

with cable
£249.00 (£211.91 + VAT)

Philips CM8833 Mk2

with cable
£225.00 (£191.49 + VAT)

1M Cartoon Classics

£369.00 inc VAT

Class of 90's

£439.00 inc VAT

Quantum 52M Disk

+ Controller for A1500
£329.00 inc VAT

Accessories

	Inc VAT
Joystick/Mouse twin extension	£4.70
3M Joystick/Mouse 3M ext	£3.75
A500 Printer lead	£7.95
A500 to Scart lead	£9.95
Modulator/Disk Extension	£10.95
23 Way Plug or Socket	£3.45
A500 Dust Cover	£4.70
Mouse Mat (thick soft type)	£4.95
A501 Memory Upgrade/Clock	£42.00
KCS Powerboard 740K & IBM	£224.90
Mouse House	£2.95
GVP Series 2 with 52M HD	£409.00
IM Internal 3.5" drive	£57.50
A500 Replacement PSU	£39.00
1/2 Meg Ram No Clock	£23.90

Naksha Mouse

With house & mat
£21.50 inc VAT

Squik Mouse

£13.90 inc VAT

1/2 Meg Ram + Clock

£24.95 inc VAT

Phone for Amiga Software catalogue.
Many titles inc. Educational.

Star

LC20	149.00
LC200	199.00
LC2410	188.00
LC24200	244.40
LC24200Col	299.00

prices inc. VAT cable & paper

Printer Dust Covers

Most types in stock
from **£4.70** inc VAT

Deskjet 500

H.P. 300dpi Inkjet printer
3 year warrantee
£386.58
(£329.00 + VAT)

Swift 24

2 year warrantee
£245.00 inc VAT
Colour kit with printer £24.00

Citizen Swift 9

with cable & paper
£175.00 inc VAT

Citizen 120D+

with cable and paper
£128.00 (£108.94 + VAT)

Cumana CAX354

External 1Mb Drive
£56.95 inc VAT

A590 20Mb Hard Disk

£269.00 inc VAT

DISKETTES

SONY branded
(100% certified error free)

	Inc VAT
10 3.5" DS/DD 135 tpi	£7.50
50 3.5" DS/DD 135 tpi	£32.30
100 3.5" DS/DD 135 tpi	£59.93
1K 3.5" DS/DD 135 tpi	£540.50

DISKETTES

SONY bulk
(lifetime warranty)
(100% certified error free)

	Inc VAT
10 3.5" DS/DD 135 tpi	£5.95
50 3.5" DS/DD 135 tpi	£19.80
100 3.5" DS/DD 135 tpi	£37.95
250 3.5" DS/DD 135 tpi	£88.42
1K 3.5 DS/DD 135 tpi	£339.58
50 x 3.5" Disk Box with lock	£5.99
100 x 3.5" Disk Box with lock	£7.50

Phone for our 48 page catalogue
EDUCATIONAL AND GOVERNMENT ORDERS WELCOME
All products have a 30 day money back & 12 month warranty.
Prices are subject to variation without prior notification.
Established 6 years. 3 minutes from M27 Junction 11.
Free parking. Open 9 to 5.30 Mon. to Friday. 9 to 2 on Saturday
Postage 94p (80p + VAT) Securicor £6.46 (£5.50 + VAT)

WeServe

Access

Larger items delivered by Securicor

VISA

Amiga Shopper Dept.
40-42 West Street,
Portchester, Hants.
PO16 9UW
Tel: 0705 325354

AMIGA SOFTMACHINE AMIGA



COMMODORE HARDWARE

A500	Options from £314.99
A500 1Mb Cartoon Classics	£379.99
A500 First Steps	£459.99
A1500	Options from £669.99
A3000 16Mhz + 40Mb HD	£2089.99
A3000 25Mhz + 40Mb HD	£2509.99
A3000 25Mhz + 105Mb HD	£2924.99
A1084S Colour Monitor	£254.99
A1950 Multisync	£439.99
A590	Options from £289.99
A1011 1Mb 3.5" Drive	£79.99
A501 Ram Expansion/Clock	£44.99
A520 TV Modulator	£24.99

SuperRAM 500RX

- SuperRam 500RX for Amiga 500 computers.
- Options of 0.5, 1 & 2Mb using 256k Zip Ram
- Options of 2, 4 & 8Mb using 1Mb Zip Ram
- Auto Configuring

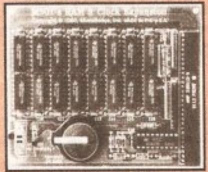


- Zero wait states & hidden refresh
- Amiga bus pass-through
- 2Mb version populated with 1Mb Zip Ram

£179.99

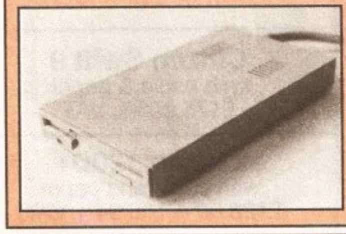
Microbotics Ram Expansion

- Microbotics m501s 512k fast ram expansion
- Expand your Amiga 500's memory to 1 megabyte internally



- Battery backed clock with calendar
- On/Off switch
- Comparable to Commodore A501
- Only £29.99

Roctec 3.5" Slimline Drive



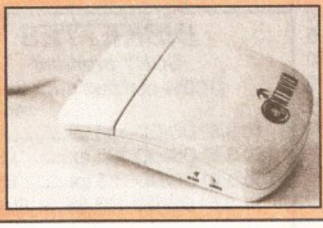
- Citizen drive mechanism
- Capacity: 880k (formatted)
- Access time: 3ms track to track
- 0.9 inches high
- Enable/disable switch
- 23-pin pass-through socket
- Allows connection of a 3rd drive £54.99

JUST IN Turbocharge your A500/1500/2000

- Microbotics VXL30 32-Bit
- 68030 based accelerator
- 25Mhz version only £249.99
- 40Mhz version only £394.99
- Optional 68882 FPU £130.00
- 2 & 8Mb 32-Bit memory TBA

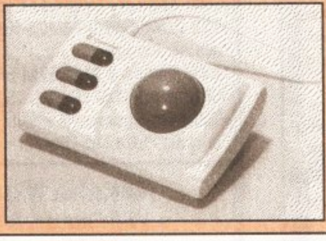
Contriver Euromouse

The most responsive microswitched upgraded mouse on the market. Comes complete with mouse pocket and carries a 10 day money back satisfaction guarantee. £14.99

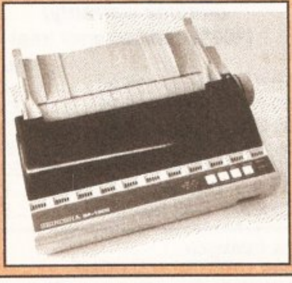


Contriver Trackball

Save on desk space with this ultra-responsive trackball. Features three locking drag buttons and carries a 10 day money back satisfaction guarantee. £24.99



Seikosha SP-1900AI Printer



- 192/160 cps Fast/Std Draft
- 48/40 cps Fast/Std NLQ
- Push tractor with paper parking
- Auto paper load and eject
- Complete with centronics cable
- £119.99

Philips 8833/II

- 14" colour monitor
- 640 x 200 pixels on RGB input
- Supplied complete with cables



- Optional tilt/swivel base available
- Free F-19 Stealth Fighter
- £239.99

SOFTWARE

WORD PROCESSORS/TEXT EDITORS

Excellence 2	£99.95
Kindwords 2	£36.95
Pen Pal	£62.95
Protext v5	£102.95
Pro Write v3.1	£102.95
Quickwrite	£39.95
Scribble Platinum	£42.95
Transwrite 2	£31.95
Turbo Text	£49.95
Word Perfect	£192.95
Wordworth	£89.95

DESKTOP PUBLISHING

Gold Disk Type each	£31.95
Outline Fonts	£99.95
Pagesetter II	£46.95
Pagestream v2.1	£144.95
Proclips	£21.95
Professional Page v2	£189.95

DATABASES

K-Data	£37.95
Prodata	£55.95
Superbase Personal	£26.95
Superbase Personal 2	£64.95
Superbase Professional	£164.95
Superbase Professional 4	£259.95

UTILITIES

Cross DOS	£21.95
Diskmaster 2	£49.95
GB Route	£27.95
K-Comm 2	£37.95
Quarterback	£39.95
Quarterback Tools	£59.95
X-Copy Professional	£36.95

EFFECTS/PRESENTATION/TITLING

Big Alt Scroller	£42.95
Broadcast Titler 2	£189.95
Broadcast Font Enhancer	£109.95
Home Titler	£34.95
HyperBook	£54.95
Pro Titler	£126.95
Scala	£189.95
Title Page	£134.95
TV Show v2	£56.95
TV Text Professional	£94.95
Video Effects 3D	£132.95
Video Titler 3D	£78.95

AUDIO/MUSIC

Audiomaster III	£46.95
Audition 4	£42.95
Bars & Pipes Prof	£222.95
Dr T's Copyist App	£94.95
Dr T's Copyist DTP	£219.95
Dr T's KCS Level II 3.5	£264.95
Dr T's Phantom	£219.95
Dr T's Tiger Cub	£94.95
Dr T's X-OR	£209.95
Music X	£99.95
Quartet	£36.95
Sequencer One	£74.95

SPREADSHEETS

Advantage	£76.95
DG Calc	£27.95
Maxiplan Plus	£51.95
Superplan	£64.95

ACCOUNTS

Cashbook Combo	£47.95
Cashbook Controller	£34.95
Final Accounts	£21.95
Home Accounts	£21.95
Personal Finance Manager	£22.95
System 3	£34.95

ASSEMBLERS/COMPILERS/LANGUAGES

3D Construction Set	£39.95
AMOS	£34.95
AMOS 3D	£24.99
AMOSCompiler	£21.95
Devpac 3	Call
GFA Basic Compiler	£22.95
GFA Basic Interpreter	£39.95
Hisoft Basic 2	Call
Hisoft Extend	£14.95
K-Seka Assembler	£37.95
Lattice C v5.01	£174.95

3D/ANIMATION/CAD/GRAPHICS

Amiga Vision	£95.95
Art Department	£55.95
Art Department Pro	£134.95
Deluxe Paint IV	Call
Deluxe Print II	£35.95
Deluxe Video III/Photolab	£74.95
Design Works	£84.95
Director 2	£97.95
Disney Animation Studio	£84.95
Draw 4D	£149.95
Imagine	£179.95
PIXmate	£38.95
Professional Draw v2	£99.95
Real 3D Beginners	£127.95
Real 3D Pro Turbo	£359.95
Spectracolour	£58.95

EDUCATIONAL

Better Maths 12-16 yrs	£19.95
Better Spelling Over 8	£19.95
Fun School 2 Under 6	£14.95
Fun School 2 6-8	£14.95
Fun School 2 Over 8	£14.95
Fun School 3 Under 5	£17.95
Fun School 3 5-7	£17.95
Fun School 3 Over 7	£17.95
Kids Type	£21.95
Magic Maths 4-8 yrs	£19.95
Maths Mania 8-12 yrs	£19.95
M Beacon Teaches Typing	£22.95
Mega Maths A-Level	£20.95
Micro English GCSE	£20.95
Micro French GCSE	£20.95
Micro Maths GCSE	£20.95
Primary Maths 3-12 yrs	£20.95
The Three Bears	£19.95

HARDWARE/PERIPHERALS

Citizen 120D+	£131.99
Citizen 124D	£194.99
Citizen Swift 9	£187.99
Citizen Swift 24	£284.99
Star LC-20	£154.99
Star LC24-10	£199.99
Star LC-200	£214.99
Star LC24-200	£239.99
Star LC24-200 Colour	£299.99
Cumana 1Mb 3.5" Drive	£69.99
Supra 52Mb HD 1/2/4/8Mb Ram	Call
AT Once	£179.99
Hitachi Camera & Lens	£224.99
Digiview	£99.99
Vidi Amiga + Vidi Chrome	£114.99
Vidi RGB Splitter	£69.99
Golden Image Scanner	£179.99
Minigen	£102.99
Linnet Modem	£161.99
Supra 2400 Modem...from	£129.99
AMAS	£71.99
Audio Engineer Plus	£179.99
Mastersound	£29.99
Perfect Sound	£49.99
Soundmaster	£109.99
Golden Image Mouse	£19.99
Naksha Mouse	£24.99
Universal Monitor Stand	£9.99
Universal Printer Stand	£6.99
Centronics Printer Cable	£4.99
RS232 Cable	£9.99
Scart Cable	£9.99
3.5" 80 Capacity Box	£6.99
10 x Sony Bulk 3.5"	£5.99
50 x Sony Bulk 3.5"	£24.99
100 x Sony Bulk 3.5"	£44.99

Please call us for a price on any hardware, software or peripherals you may require but can't see listed

Please make cheques/postal orders payable to SOFTMACHINE. All items subject to availability.
All prices and manufacturers specifications subject to change without notice.
All prices include VAT and UK delivery. E&OE All trademarks acknowledged.

SOFTMACHINE

Dept AMS 11, 20 Bridge House, Bridge Street, Sunderland, SR1 1TE
Sales Tel: (091) 510 2666 Enquiries Tel: (091) 510 2777 Fax: (091) 564 1960
Goods are not offered on a trial basis. Goods are offered for sale subject to our conditions of sale.

Callers welcome. Our hours of business are 9.30 till 5.30 Monday to Saturday.

continued from page 126

professional standards; the results will be muddy and will be made even muddier by the reproduction process.

But don't waste your time and money on a colour scanner unless you're looking for really high-quality (and expensive) end results. If you're going to use a scanner only for getting black-and-white diagrams on to the page (line art, in other words, like that cartoon of me on the first page of this article) then you need nothing more than a monochrome hand scanner.

I use the Golden Image scanner (reviewed in *Amiga Shopper* issue 5), which comes with the excellent *Touch-Up* software – a sort of black-and-white *DPaint*-cum-*Professional Draw* – but you might also like to consider the Pandaal scanner (reviewed in issue 3) which comes with simpler software.

TOOLS OF THE TRADE

The hardware side of things is a real jungle because there is so much to choose from. Software, though, is much easier to sort out. You have just four choices for your main DTP package: *PageSetter II*, *Professional Page*, *PageStream* or *Saxon Publisher*.

If you are never going to use colour and don't want PostScript output, then *PageSetter II* deserves more than a casual glance. Despite its cheap price tag, it is basically a black-and-white version of its big brother, *Professional Page*. The main restriction is that *PageSetter II* cannot rotate text or graphics. If this isn't a problem then I happily recommend that you start with this package. I've seen it selling for less than £50 at computer shows.

But don't get *PageSetter II* mixed up with the earlier incarnation of the same program, *PageSetter* (without the *II*). The two programs couldn't be more different. The original *PageSetter* was next to useless for even amateur DTP, whereas *PageSetter II* can produce results every bit as good as programs costing five times more.

Saxon Publisher is the new boy in town. It's got no track record and is still on version 1, which can only output to a PostScript device. A promised upgrade will support Compugraphic fonts and dot-matrix printers, but I've yet to see it. Expect an in-depth review as soon as the UK distributors send me a copy. (At the time of writing this was "next week", so hopefully the review will appear in the next issue.)

Professional Page and *PageStream* have been around for a few years and both are into second versions. I've taken a lot of flak recently about my opinions of *PageStream* (slow, and buggy graphics handling) and *Professional Page* (faster, and buggy text handling), and I'm not going to start the argument up again now by recommending one or the other. Read the exhaustive reviews in *Amiga Shopper* issues 1 and 2 and make your own mind up.

The truth is that neither *Professional Page* nor *PageStream* is of a true professional standard. For example, on a professional system you would have facing pages on-screen (a 'spread'), and if you placed a graphic in the middle between the pages (across the 'gutter') the software should be able to automatically duplicate and split the graphic correctly so that one half is on the left-hand page bleeding off the right edge, and the other half on the right-hand page bleeding off the left.

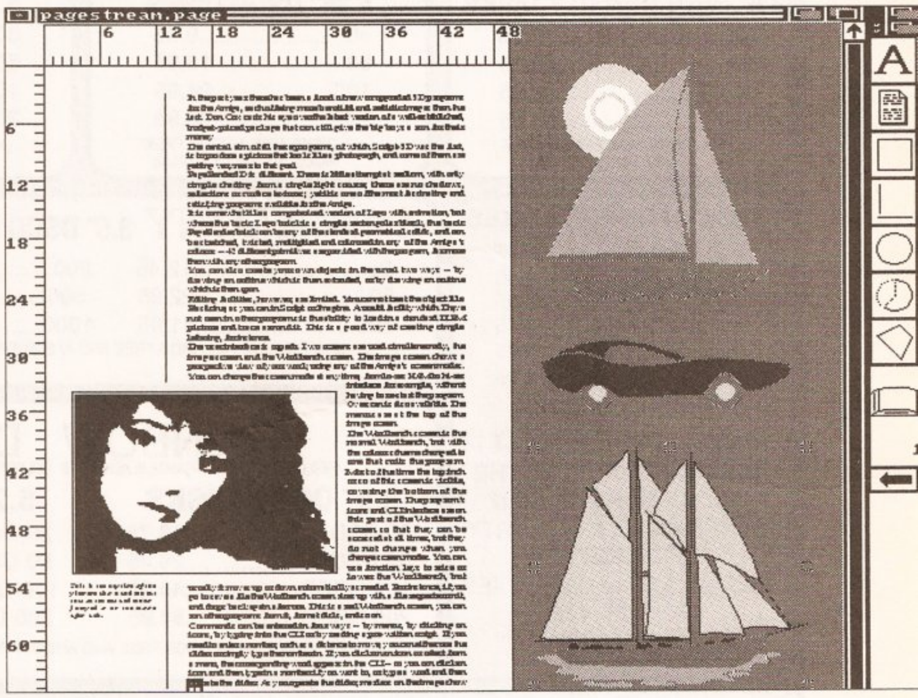
This is a useful design technique for anything that has facing pages, like a booklet or a brochure or a magazine, and doing it by hand, which is how both *Professional Page* and *PageStream* force you to do it, takes time and is error-prone.

Nevertheless, these are the best we've got. I use *Professional Page* to produce a monthly magazine. Other *Professional Page* users often ask how I do some of the things I do, which only goes to show that most of the real restrictions are inside your head, not the software.

That may sound a little arrogant, but if you don't have a background in design stick some books on your shopping list because page layout isn't like painting pictures – there are tried and tested techniques which work, the ultimate goal being to get the message across either clearly, or clearly and with impact. Sure, there's a lot of artistic license involved behind the message, but the message has to be the main thing – your document is going to be read, not framed and hung on the wall.

Let's not get into a typography, typesetting and design lesson here – that's what the books are for. However, don't imagine that thousands of pounds-worth of specialised hardware and software is going to turn you into a desktop publisher overnight; it won't, it's a skilled job which will have to be learnt. You can save a fortune by designing and laying out your own publications, but you'll have to invest lots of time and effort – don't expect the software to do it all for you.

On top of the DTP software, you'll almost certainly need some extra fonts. *PageStream* comes with about 20, which will be enough to get you going, but *Professional Page* comes with only two, so you'll have to buy the additional Outline Fonts pack (about £100) which contains 35 more Compugraphic fonts.



Once you get used to the way *PageStream* works it's as easy to use as any other DTP package. But the harder you push *PageStream* the more fragile it feels, and some of its claimed 'advanced' features either crash the Amiga or don't work properly – particularly anything graphics-related. In 16-colour interlace mode *PageStream* crawls along at an unacceptably slow pace, even with an accelerator. It doesn't have an art board as such, but you can do temporary work in the grey-shaded 'bleed area', shown here to the right of the page.

TAKING STOCK

So, given all the foregoing information, let's have a look at a possible system setup. (The following prices are very approximate, and should only be taken as a guide.)

First, upgrading your Amiga 500 to 1Mb of graphics memory will cost about £100, and 2Mb of expansion memory will be about the same sum again – £100 or so. To save slightly, you can put that 2Mb into, say, a 40Mb hard drive – which should run in at about £400. You will need to get a monitor, too – the standard Commodore or Philips model costs around £200.

Unless you really need it, you'd be better off buying an inkjet or bubblejet printer, rather than a PostScript laser printer – after all, if you need really professional-looking output you can go to a DTP bureau. So budget for an inkjet printer at about £600.

The decision on which accelerator board to buy is perhaps the hardest – perusing the adverts reveals prices ranging from under £200 to almost £2,000. At the present time, for example, it would be worth waiting for some reviews of the new Microbotics VXL30 accelerator, which has a high specification and is selling for about $400 in American magazines.

A hand scanner should cost you about £150, and the purchase of whatever DTP software you finally decide on, along with some extra fonts, will cost you somewhere in the region of £300.

So, depending on which accelerator you buy, that makes a grand total of somewhere between £2,000 and £2,500 for the system.

The alternative upgrade route was to buy a complete Graphics Workstation (with more memory, a bigger hard drive and a flicker-fixer) for £2,000. Add to that the cost of the monitor, printer, scanner and software and this route will cost you just over £3,000. But remember that this way you have your A500 spare – to let the kids play on or to sell, recouping a few hundred pounds.

Either way, you will have a system with which you can desktop publish with results close to true professional standards. At a later date you might want to buy more memory and a larger hard drive, and perhaps a PostScript laser printer (prices seem to be falling every month), but this can wait until the money that you'll be making from DTP starts flowing in... AS

Data analysis

Mark Smiddy shows how to present the results of the survey he conducted last month in an easily digestible form

Using computers in business requires you to do more than just plug in and switch on the machine. It requires thought, planning and, wherever possible, a high degree of data redundancy (never keep all your eggs in one basket or all your data on a single hard disk). Moreover, it can also necessitate a lot of manual work – collecting and collating the data into a machine-readable form.

The Beer Test (see below) is a typical example where computers are used to amass and quantify a huge amount of data. Although the whole thing could have been done manually, it would have taken many hundreds of man-hours.

LIQUID ASSETS

One of the first questions to ask is "what do people drink and how can they be encouraged to drink more?"

THE BEER TEST

The Beer Test is a survey of the drinking habits of members of a north-eastern club. Aimed at improving the club's services, it was described in detail in last month's issue. For back issue details, see page 118.

The survey can only determine *what* people drink – not the quantity they consume. However, the latter can easily be discovered by analysing the stock levels of each. By coupling the two, it is possible to determine, for instance, which bars need which pumps. Consider this:

There are three bars (serving areas). Each has two pumps each for the most popular beer and lager, and one each for the next most popular beer and lager, plus a smattering of others. Using simulated figures, let's imagine the following stock levels:

	Barrels per week	Pumps in bars
Beer A	**20**	**2**
Beer B	**12**	**1**
Lager A	**15**	**2**
Lager B	**5**	**1**

This seems like a fair assessment purely on the stock figures. However, there is a wider issue to consider – how many people are drinking each beer and lager? In pubs, where everyone is equal (except the regulars, who are more equal than the others) most social drinkers will have experienced this scene:

Customer: "Two pints of lager and a packet of crisps please. Er, two pints of lager and a packet of crisps *please*. Two *pints* of *lager* and a pack…"

Bar person (consulting watch with a grim smile): "Sorry mate – last bell's gone!"

This conversation is likely to be followed by a colourful exchange which has no place in the pages of a serious magazine like ours. However, the situation can be partially relieved by the number of pumps available and their positioning both in the building and on the bar. If we assume that a good barman can, on average, serve a customer in one minute using one pump, and 45 seconds using two, consider this:

Case A: Dave and Mike are nightly regulars to the bar area. Each consumes 4 or 5 pints of beer 'A' in a typical three-hour session. Between the two, they will occupy two pumps and one staff member for about eight minutes.

Case B: Bill, Ian, Ted and Cliff are in the lounge three nights per week and all drink beer 'B'. In their typical three-hour session each will consume two or three pints of their chosen brew. Drinking in rounds, in a typical session they will occupy one pump and a member of staff for around twelve minutes.

The folk in Case A will account for far more sales than those in Case B in raw terms. However, the people in Case B actually use more bar and pump time. Multiply that by a typical cross section of regulars and you get long queues.

Of course, a good bar manager can judge this situation before it occurs and increase staffing levels to cope. Nevertheless, computer analysis can aid their decision by helping to predicting where and when the log-jams are most likely to occur. A human being must make the final decision, though, because dozens other minor factors must be considered: from the time of day and the weather to what's on the television that night!

ASKING QUESTIONS

All the information necessary to answer the computer side of this conundrum is held in the database – now we need to decide how to get at it. The best way to do this is break the question down into its component parts. Here is the question in a more detailed form:



"If a picture tells a thousand words, then a good spreadsheet must be a book waiting to be written."

Mark Smiddy

"What proportion of **regular** members drink the **two most popular beers** and **whereabouts** do they prefer to drink?"

I've highlighted the meaningful parts of the problem – those where a database query can be applied. Next, we must decide how best to present the information – because even with just a couple of variables there are several ways to display the resultant analysis; and this in turn affects how the question should asked.

There are three ways to graph this data, depending on what you want to show; or, depending on circumstances, what you don't!

- A pie chart can show the amount of each type of beer drunk in each room, using either the room or beer names as segments. However, a separate chart must be prepared for each. For instance: the spread of beer 'A' drinkers in each room on one chart and another for the spread of beer 'B' drinkers.

- A bar chart can show the same data as the pie charts but with all the information on a single display.

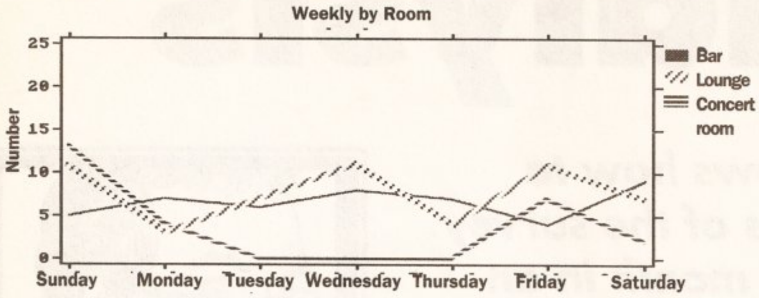
- A stacked bar chart shows the same as the normal bar chart – but the overall information is easier to see.

continued on page 132

TABLE 1

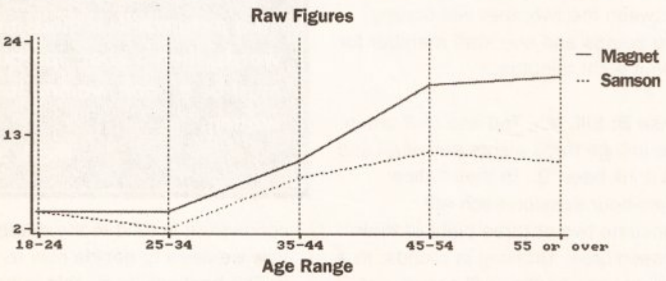
A	B	C	D	E	F	G	H	I
101	Samson drinkers average over all figures							
102		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
103	Bar	7	6	8	7	4	9	5
104	Lounge	3	7	11	4	11	7	11
105	Room	4	0	0	0	7	2	13

FIGURE 1 – SAMSON DRINKERS



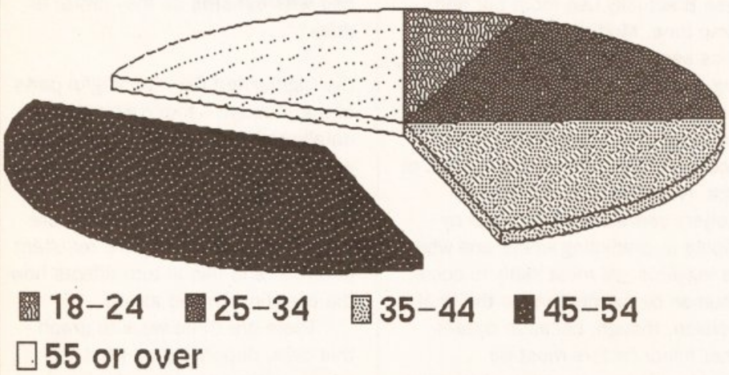
The raw results for all Samson drinkers processed into a complete weekly breakdown.

FIGURE 2 – MAGNET vs SAMSON



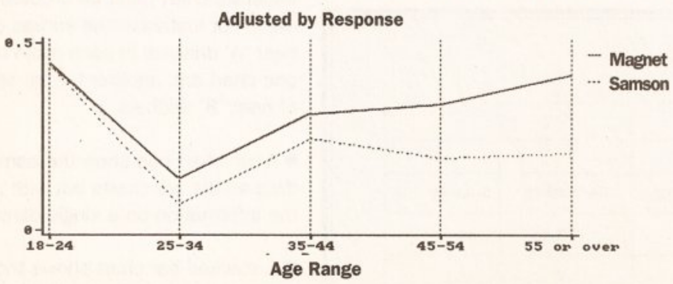
The raw results, although predictable (lagers being the preferred young person's brew) can be deceiving at first.

FIGURE 3 – DISTRIBUTION BY AGE



This chart clearly shows the split age range of this population – as you can see younger people are certainly in the minority.

FIGURE 4 – MAGNET vs SAMSON



Once the graph is recalculated according the response in each age group, a different picture starts to appear.

continued from page 131

So far, so good – but a graph can only be produced from data and the data is still in the database: hence Listing 1, just one of many report programs written for this feature. This searches the database and finds all the relevant data regarding drinkers of Samson (a strange Northern beer) among the Sunday regulars. One surprisingly weak feature of *Superbase Pro 4* is the inability to define 'GROUP' statements according to a variable – the significance of this will be discussed later.

PROGRAMMED REPORTS

The data produced by the program, of course, proves very little because the sample is highly selective – although this can be corrected later in the spreadsheet. Here's how Listing 1 works – some knowledge of Basic or *Superbase*'s DML will be helpful to understand the program:

1. Opens the single (flat-file) database containing all the data.
2. Defines the start of a report and instructs *Superbase* to suppress output of actual field data. (All we want is the totals.)
3...5 Outlines and displays the report heading.
6. Introduces a data grouping. Groups are used extensively in the Beer Test reports to aid the selection of test criteria. The first group in this report forces *Superbase* to select data day-by-day. In this case we are switching on Sunday's field which contains one of three values according to which room the member was in (unwanted values are filtered later). As mentioned previously, this must be a field name – not a variable containing a field name. This makes programming laborious and repetitive because a separate program must be written for each day.
7. Prints a blank line!
8. Opens a construct in which *Superbase* can be programmed each time the data in the field – Sunday – changes. This can be one of several values, but we are only interested in "B" for Bar , "L" for Lounge or "R" for the Concert Room. The other values – nights when the member does not attend, for instance – are filtered out at line 33.
9...13. Defines a case construct which is used to translate the single letter held in the database to

continued on page 134

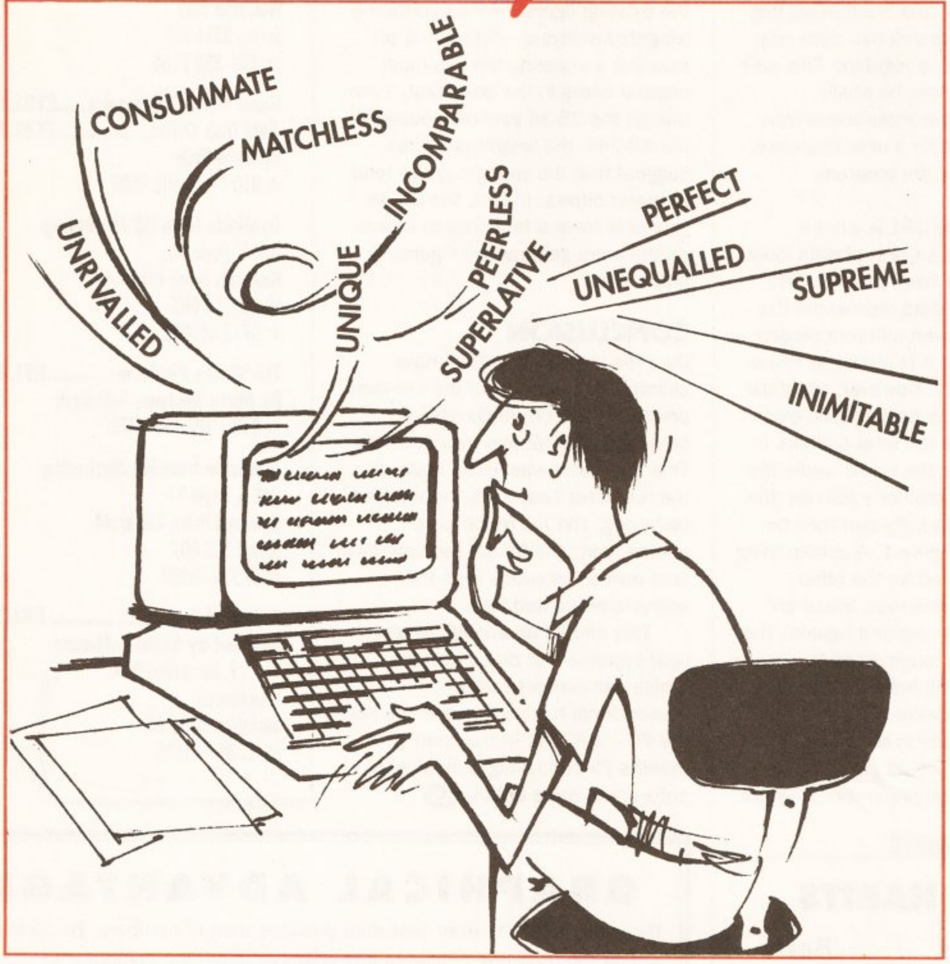
LISTING 1 ● LISTING 1

```
1.   OPEN FILE "FastBench2.0:SuperbasePro4/CLUBDATA"
2.   REPORT SUMMARIZE
3.   HEADING
4.   ? @9;"Sunday Samson drinkers by room"
5.   END HEADING
6.   GROUP Sunday.CLUBDATA
7.   ?
8.   BEFORE GROUP Sunday.CLUBDATA
9.   SELECT CASE Sunday.CLUBDATA
10.  CASE "B":room$ = "bar":? "BAR":?
11.  CASE "L":room$ = "lounge":? "LOUNGE":?
12.  CASE "R":room$ = "concert room":? "CONCERT ROOM":?
13.  END SELECT
14.  END GROUP
15.  AFTER GROUP Sunday.CLUBDATA
16.  ? @60"*****"
17.  ? @35"Total using ";room$;@60&]4; COUNT
18.  ? @60"*****":?
19.  END GROUP
20.  GROUP Samson.CLUBDATA
21.  BEFORE GROUP Samson.CLUBDATA
22.  SELECT CASE Samson.CLUBDATA
23.  CASE "2":s$ = "Irregular"
24.  CASE "3":s$ = "Occasional"
25.  CASE "4":s$ = "Regular"
26.  END SELECT
27.  END GROUP
28.  AFTER GROUP Samson.CLUBDATA
29.  ? s$;" Samson drinkers in ";room$;@60&]4; COUNT
30.  END GROUP
31.  SELECT Sunday.CLUBDATA,Samson.CLUBDATA
32.  ORDER Sunday.CLUBDATA,Samson.CLUBDATA ASCENDING
33.  WHERE (Sunday = "R" OR Sunday = "B" OR Sunday = "L") ↵
     AND (Samson = "2" OR Samson = "3" OR Samson = "4")   ↵
     AND SundayReg = "Y"
34.  END SELECT
```

The Samson report program for Sunday regulars determines who drinks Samson and their usual whereabouts. The output is refined for easy input to the spreadsheet, even though not all the results are used.

PROTEXT 5.5

"You won't be lost for words" . . .



. . . with Protext 5.5 because the pop-up thesaurus will provide you with inspiration whenever you need it. With words provided by Collins the thesaurus has 43,000 main entries and 827,000 responses!

Protext 5.5 introduces enhanced text formatting options. Automatic hyphenation lets you produce a well-spaced page layout without the bother of manually putting in soft hyphens. Protext determines the correct hyphenation points by algorithms and look-up tables. Elimination of widows and orphans is also provided. You will no longer need to worry about those infuriating single lines at the top or bottom of pages. Protext formats the text to avoid these as you edit the text. Extra blank lines at the top of a page can be suppressed.

New document analysis features provide a wealth of information about your text. You can examine a list of all the words used - alphabetically or by the number of occurrences. Other statistics shown include average word length, average sentence length and a table of the number of lines on each page.

Plus many more improvements . . .

- ☆ Enhanced file selector with different sorting methods, bulk copy and erase.
- ☆ Prodata users - mail merge directly from Prodata files, no need to export.
- ☆ Mail merge: nested repeat loops.
- ☆ New window-based help facilities.
- ☆ Improved line drawing.
- ☆ Spelling checker finds repeated word and missing capital letters.
- ☆ Conversion to and from WordStar 5.5 and Microsoft RTF
- ☆ Full printed documentation of new features.

Of course Protext still includes . . .

Choice of pull-down menu or keyboard operation, extensive printer font support and proportional formatting while editing, up to 36 files open, split screen editing, characters for 30 languages, index and contents, footnotes, newspaper column printing, file sorting, macros, indent tabs, mail merge programming language, exec files and the fastest search and replace around. Altogether the most comprehensive word processing software for your Amiga or ST.

"it's bloody brilliant" — ST FORMAT

"one hell of a performer" — COMPUTER SHOPPER

"if you need a professional word processor Protext is perfect" — AMIGA COMPUTING

"nothing else available comes close" — ST APPLICATIONS

PRODATA 1.2

New version of Prodata now with pull-down menus, mouse or keyboard operation, automatic record numbering, merge database, instantaneous filtering, prologue form, edit fields in any order, 2-across label printing. Full details available from Arnor.

Price: £85+VAT, upgrade from v1.1 £30+VAT.

PRICES (including VAT and delivery)

For Commodore Amiga, Atari ST or TT.

Protext 5.5	£152.75
Upgrade from 5.0 to 5.5	**£30**
Upgrade from 4.2/4.3 to 5.5	**£60**
Please return your original disks when upgrading	
French or German spelling dictionary	**£35.25**

When upgrading please return any extra spell checking dictionaries for a free update to the revised version.

☆ **Both Protext 5.5 and Prodata require 1Mb of memory**

Access VISA

ARNOR

Arnor Ltd (AS), 611 Lincoln Road, Peterborough PE1 3HA. Tel: (0733) 68909 Fax (0733) 67299

continued from page 132

something meaningful. The sub-headings introducing each section (data group) are also displayed here.
14. Closes the 'Before Group' statement. In many reports this would be followed by display instructions for the field data. In this case, since we only require summary data, this part is omitted.
15...19. Works in a similar manner to the 'Before Group'. This part executes when the data group changes. For instance, when Sunday's contents change from "L" to "B". At this point the total number of records matching the filter criteria since the last change is displayed.
20...30. These lines are more or less identical in function to the preceding ones. Here, the type of beer is defined as a sub-group of the room. In this way the drinkers can be categorised by the location and amount consumed.
31. Tells *Superbase* which fields to process...
32. ...and how to process them. This line ensures that the data is sorted in the correct order. If precedence were given to the Samson field, the report would become mixed up as the higher priority Sunday field got mixed up with the embedded Samson field. The simple rule of thumb is: sort ascending fields from right to left in the order they appear from top to bottom.
33. Sets the filter conditions. This cures several problems in one go. First, the Sunday field is checked for real values; next the Samson field is checked to eliminate non-Samson drinkers; finally, the SundayReg flag is checked to ensure this data only applies to Sunday regulars. This part of the program can be easily changed to either include everyone or even prompt for a user response.
34. Terminates the program.

Table 1 on page 131 is what a complete week's worth of data looks like after it has been inserted into the sheet. The data represents the results from seven different reports – in this raw form it is easier to follow than the reports. However, using the spreadsheet it is easy to gain extra figures such as the total drinkers in each room over the whole week (the rows) and the total for each day (the columns). The results can then be charted as in Figure 1. A similar thing is then performed for the other popular bitter. However, these are just the raw un-weighted figures. The graph is only a rough guide to people's drinking habits in the survey. If there were the same number of people in each group, then this chart would also give some idea of individual preferences. Figure 2 shows a more detailed breakdown, again with unweighted figures.

However, the survey was randomised in an attempt to discover the actual age range of members – Figure 3. By combining the percentage of people attending with the existing figures, we can obtain a weighted analysis – Figure 4 is an example comparing the two most popular beers in the Beer Test. Even though the 25-34 year-olds outweigh the 18-24s, the weighted figures suggest that the younger group tend to prefer bitters. In fact, the 25-34 year olds have a tendency to lagers as the more generalised Figures 5 and 6 show.

CONCLUSION

Over the last few months I have skimmed the surface of the two most powerful and potentially useful business applications ever devised. This two-parter was just a taste of the real Beer Test – any more would be boring. The full report is, of course, confidential but you can draw your own conclusions from the analysis presented here.

This should be enough to whet your appetite and prove that the Amiga can compete with conventional business machines like the PC – and win! In the coming months I'll be looking at business software in more detail. AS

SHOPPING LIST

Superbase Professional 4...£411.20
By Precision Software
6 Park Terrace
Worcester Park
Surrey KT14 7JZ
☎ 081-330 7166

Home Office Advantage.....£102.12
Gold Disk Office................£132.78
By Gold Disk
☎ 010 1 416 602 4000

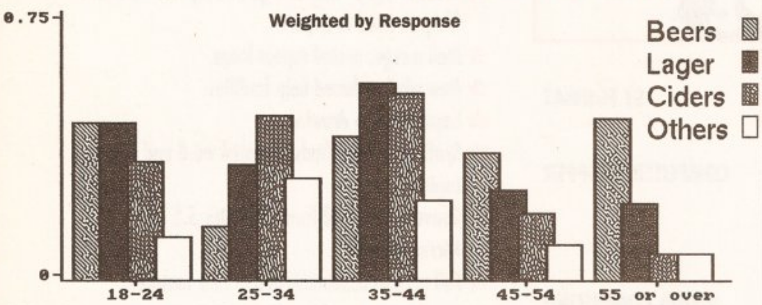
Available from HB Marketing
Unit 3, Poyle 14
Newlands Drive, Colnbrook
Slough SL3 0DX
☎ 0753 686000

The Works Platinum............£91.91
By Micro Systems Software
☎ 010 1 407 790 0770

Available from HB Marketing
Unit 3, Poyle 14
Newlands Drive, Colnbrook
Slough SL3 0DX
☎ 0753 686000

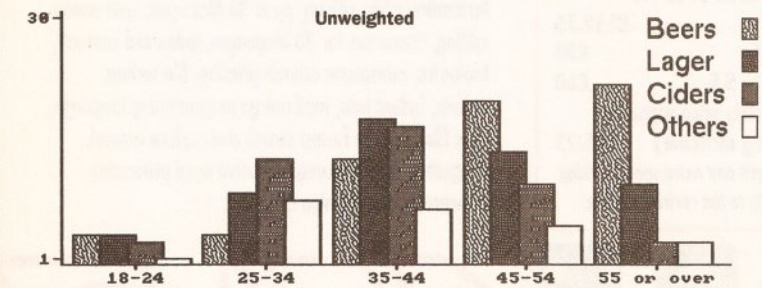
K-Spread 3.........................£82.25
Supplied by Kuma Software
Unit 12, Horseshoe Park
Pangbourne
Berkshire RG8 7JW
☎ 0734 844335

FIGURE 5 – DRINKING HABITS



This demonstrates which drinks people prefer – roughly graded into four categories. As might be expected, lagers and ciders are as popular with young people as the beers are with older ones.

FIGURE 6 – DRINKERS BY AGE



This simple bar chart demonstrates what people are drinking. In an ideal world, this one should closely match the weighted figures.

GRAPHICAL ADVANTAGE

The analysis of the Beer Test data provides a lot of numbers. By carefully writing the reporting programs it is possible to get the computer to produce pre-written reports. However, although figures are fine for those with a penchant for them, the average manager – most people, come to that – would much rather look at a diagram. In this form, although the actual values may not be obvious the relationship between them can be clearly demonstrated.

By this reckoning, if databases are the best applications to compile data then spreadsheets are the best ones to display them; and one of the best Amiga spreadsheets available is Gold Disk's *Home Office Advantage* – usually just called *Advantage*. Although I used the enhanced version 1.1, *Advantage 1.0* can be found in Gold Disk's *Office* bundle. Another benefit of a spreadsheet is its ability to massage the results in ways which could prove difficult in a database reporting language – even one as powerful as *Superbase Pro 4*'s.

The demographics required here are simple enough for many Amiga spreadsheets to handle. *Analyse 2* (in the *Works* pack) and Kuma's *K-Spread 3* to name just two are both eminently capable of handling the relatively simple demands placed on them by this particular application.

All good spreadsheets offer a some sort of graphics facilities; indeed, you would be foolish to even consider buying one that did not support at least simple charts. This specific application and the type of data it produces lends itself particularly well to bar (column) charts as well as the simpler pie charts.

Surprisingly, although *Advantage* has both of these – and a lot more besides – it is not possible to merge two (or more) charts. This feature, which seems lacking from Amiga spreadsheets as a whole, is very useful for comparing graphs. Thanks to IFF, however, this can be easily overcome by saving the two charts separately and merging them in an art package (*DPaint*, for instance) prior to presentation.

MEGA BLITZ!

THE ONE STOP SHOP FOR AMIGA PD SOFTWARE

PHONE 0782 208228 FAX 0782 281506

THE DISKS BELOW ARE ONLY A SMALL SELECTION FROM OUR VAST LIBRARY OF OVER 2000 DISKS

UTILITIES

PDU 10 Word Processing+Databasing
PDU 16 Air Tunnel Simulation
PDU 31 Fish#143 RIM Database
PDU 32 Fish#144 Analytic spreadsheet
PDU 43 Fish#203 Assembler & C eg
PDU 44 Fish#215 Mandelvroom V2.0
PDU 45 Fish#210 Scientific calculator
PDU 46 Fish#213 Icons(300 in 8 colors)
PDU 51 Fish#219 Astronomy program
PDU 52 Fish#52 A-Z Text Editor
PDU 60 Fish# 237 CLIprint
PDU 70 Fish 193 Keymap Editor
PDU 72 SID V1.06 The ultimate disk util.
PDU 80 Fonts and Surfaces
PDU 81 Disksalve 1.3
PDU 98 Celtics Demomaker
PDU 99 Ham Radio utils(5 disks)
PDU 101 Menu-Maker
PDU 102 Label designer
PDU 103 Icon-Maker
PDU 104 Icon-Mania
PDU 105 Crossword Creator
PDU 118 Various CLI utils
PDU 149 Icon Fun
PDU 151 Fixdisk-disk repairer
PDU 164 Games Music Creator
PDU 168 Vaccine-Booster(Virus killer)
PDU 169 QuickBase-Database
PDU 185 ANC22 (Excellent utils)
PDU 186 Falcon Bootblock Creator
PDU 194 Pman Virus Killer
PDU 200 Virus Killer Pro V2.0
PDU 207 Perfect Sound V1.93
PDU 257 Fish#349 MED V 3.00
PDU 262 MED Modules
PDU 318 Red sector demo maker
PDU 349 Master virus killer V 2.1
PDU 358 Tetracopy

DEMOS

PDD 1 Anarchy Demo
PDD 4 Deathstar Megademo(2 disks)
PDD 7 Elvira Demo
PDD 14 RAF Megademo(2 disks)
PDD 16 Robocop Demo
PDD 20 SAE Demo#25
PDD 21 SAE Demo#32
PDD 31 Anarchy"Ooh its obscene III"
PDD 51 Hacktrick#1 Arsewipe
PDD 52 Hacktrick#2Smashing day out
PDD 55 Kefrens Megademo 8(2 disks)
PDD 62 Northstar Megademo#2
PDD 70 Rebels Megademo
PDD 72 Red Sector Demodisk#4
PDD 73 SAE Demos#23
PDD 74 SAE Demos#36
PDD 75 Scoopex Demos
PDD 76 Scoopex Megademo
PDD 91 Trilogy Megademo#1
PDD 94 Vortex Megademo
PDD 96 Magnetic Fields Demo#36
PDD 97 Predators Megademo(2 disks)
PDD 107 Budbrain I (2 disks)
PDD 115 Magnetic Fields Demo#40
PDD 116 Magnetic Fields Demo#41
PDD 130 Chubby Brown
PDD 131 Crionics Demo
PDD 132 Giants Megademo(2 disks)
PDD 134 Magnetic Fields Demo#45
PDD 145 SAE Demo#31
PDD 152 Flash"No Brain No Pain"(2)
PDD 153 Billy Connally Demo(2 disks)
PDD 160 Hacktrick"Rave-on"
PDD 177 Budbrain II
PDD 179 Crionics Total Destruction
PDD 186 Flash Demos#2
PPD 209 Rutger Demodisk
PDD 212 Space Pack#32

ANIMATION

PDA 9 Knight Animation(1 meg)
PDA 12 Agatron Star Trek Anims 2
PDA 13 Agatron Star Trek Anims 17
PDA 14 Puggs in Space
PDA 18 Miller Lite Advert
PDA 31 Nude Girls Anim
PDA 34 Basketball Anim
PDA 35 BFPO Slideshow(18+)
PDA 36 BFPO Slideshow#2(18+)
PDA 41 Digiviewer Slideshow
PDA 42 Dragons Lair Demo
PDA 45 Monocycle & Sportscar(1 meg)
PDA 47 Holsten Pils Advert
PDA 49 Mayfair Vol.23 no3(18+)
PDA 50 Mega Clean Show V1.7
PDA 54 NASA Graphics
PDA 56 Newtek Demoreel1(2)(1meg)
PDA 57 Newtek Demoreel3(2)(1meg)
PDA 56 Newtek Demoreel1(2)(1meg)
PDA 57 Newtek Demoreel3(2)(1meg)
PDA 58 Paradise Slideshow
PDA 61 Sabrina
PDA 63 Space Anims(1 meg)
PDA 65 Star Trek Anims
PDA 63 Walker Demo1 (1 meg)
PDA 69 Walker Demo1 (2meg,2disks)
PDA 70 Walker Demo2(1 meg)
PDA 73 Westcoast Cracker#4(18+)
PDA 74 Bodeans Bordello#1(18+)
PDA 75 Bodeans Bordello#4(18+)
PDA 76 Playboy(18+)
PDA 77 Sam Fox(18+)
PDA 78 Utopia#1(18+)
PDA 79 The Final Ecstacy#1(18+)
PDA 80 Walker Demo 2(2 meg,2 disks)
PDA 81 Ray Trace Art.DBW Render util
PDA 86 Utopia#4(18+)
PDA 89 Bodeans Bordello#9 (18+)
PDA 90 Bunsen Burner-Jet Fighter anim
PDA 92 D.Landers Sci-fi Show#1
PDA 93 D.Landers Sci-fi Show#2
PDA 110 Bruce Lee Enter the Dragon
PDA 11 Bruce Lee Slideshow II
PDA 112 Dragons Lair II Demo
PDA114 Neighbours Slideshow
PDA 116 Terminator

MUSIC

PDM 5 MFI'Electric CLI IV'
PDM 6 Winkers song(2 disks)
PDM 9 Ride on time & Batdance
PDM 19 Bad-M.Jackson
PDM 20 Bat Dance
PDM 27 DMOB Megamusic III
PDM 28 Enemies Music III
PDM 30 Digital Concert II
PDM 31 Digital Concert III
PDM 33 Helloween'Follow the Sign'(2)
PDM 35 Think were alone now-Tiffany
PDM 36 Land of Confusion-Genesis
PDM 38 Miami Vice Theme (4 disks)
PDM 40 MFI Vangelis Demo
PDM 65 Digital Concert IV
PDM 72 Popeye meets the Beachboys
PDM 80 Digital Concert VI
PDM 82 Freddy Kruger
PDM 83 Kefrens Jukebox
PDM 84 Madonna-Hanky panky
PDM 85 Miami Vice-Crockets Theme
PDM 87 RIP Eruption
PDM 88 Slab Music
PDM 91 100 Most Remembered C64 tunes
PDM 95 Hi-Fi Demo
PDM 104 BassX#5 Power Remix
PDM 105 BassX#6 Sydney Youngblood
PDM 106 Betty Boo
PDM 109 Depeche Mode
PDM 110 DMOB Music I
PDM 111 DMOB Music II
PDM 112 DMOB Music IV(2 disks)
PDM 117 Flash Gordan (2 disks)
PDM 118 Hacktrick 'Loadsamoney'
PDM 120 Laurel & Hardy (2 disks)
PDM 128 NASP V2.0
PDM 131 Petshop Boys Remix#1
PDM 132 Petshop Boys Remix#2

GAMES

PDG 1 Star Trek-Final Frontier(2 disks)
PDG 2 Star trek (3 disks,2 drives)
PDG 5 Card & Board Games
PDG 18 Marble Slide
PDG 19 Destination Moonbase
PDG 21 Boing the Game (2 disks)
PDG 26 Treasure Search
PDG 31 Moria
PDG 32 Legend of Farghail
PDG 33 Arcadia(Breakout style game)
PDG 34 Dynamite Dick
PDG 35 Pair It
PDG 36 Snakes & ladders/Reversi
PDG 37 Super Quiz

BLIT - A - COPY MKII

THE ULTIMATE BACKUP UTILITY !!!

BACKS UP ALL KNOWN SOFTWARE-EVEN THE ONES OTHERS WON'T
THIS DEVICE IS PROBABLY THE MOST POWERFUL AVAILABLE
COMPLETE HARDWARE AND SOFTWARE PACKAGE

ONLY 29.95

(THIS DEVICE REQUIRES AN EXTERNAL DISK DRIVE)

CLIP ART

There is a total of 13 disks in the clip art range.All are in IFF Format & are ideal for DTP.There are loads of images to choose from,ranging from fancy borders to special occasions & from people to animals etc etc.

All 13 disks for only £15.00

DISK PRICES

1-9....................£1.50
10-19...............£1.25
20+..................£1.00

FREE CATALOGUE DISK

POSTAGE AND PACKING FREE ON ALL ORDERS OF 3 DISKS OR MORE,UNDER 3 DISKS PLEASE ADD £1.00.UK MAINLAND ONLY EUROPE ADD 25PPER DISK REST OF WORLD ADD 50P PER DISK

PLEASE NOTE ALL OUR PUBLIC DOMAIN IS SUPPLIED ON TOP QUALITY KAO BRANDED DISKETTES

PACK 1

Home Buisness Pack
This 8 disk pack contains:-
Spreadsheet
Word Processor
Amiga Spell
Memo-pad
Inventory
Database etc etc
A must for home accounts!
£10-00

PACK 2

Demo Pack (10 disk pack)
Budbrain 1 (2 disks)
Budbrain 2
Scoopex mental hangover
Crionics "neverwhere"
Horizon "sleeping bag"
Palace "pulling the trigger"
Quartex "substance"
Phenomena "interspace"
Decay "simpsons demo"
A great starter pack
£11-00

PACK 3

Music Pack (10 disk pack)
Vision music masters
Crusaders "bacteria music"
Crack music disk
Jetset overload music disk
Raf megamix 1
Flash digital concert 6
Flashing bytes "sweet songs one"
Alcatraz "panic voices of energy"
Crusaders micro concert
Archaos music disk
£11-00

PACK 4

Adult pack (10 disk pack)
Sabrina,Sam Fox (2 disks)
Bodeans Bordello #2
Bodeans Bordello #3
Bodeans Bordello #10
Bodeans Movies
West Coast Cracker
BFPO #1,BFPO #2
Utopia #1
£11-00

PACK 5

Music makers pack
Protracker
Noise tracker
Star tracker
Songs disks (3 disks)
Insturment disks(4 disks)
A must for music makers
£1100

PACK 6

New release pack
This is a 10 disk pack containing all the latest demos form all the best groups e.g LSD,Ipec Elite Flashing bytes etc. etc.
This pack changes on a weekly basis,so is kept bang up to date.
A must for only
£12-00

WE ACCEPT ALL MAJOR CREDIT CARDS PLEASE MAKE CHEQUES AND PO'S PAYABLE TO P.D DIRECT AND SEND ORDERS TO:-

UNIT 3 DEPT ASH, RAILWAY ENTERPRISE CENTRE, SHELTON NEW ROAD,STOKE ON TRENT, ST4 7SH

AMIGA BOOKS

Advanced Amiga BASIC	£16.95	AmigaDOS: A Dabhand Guide	£14.95
Advanced System Prog Guide	£29.95	Becoming an Amiga Artist	£16.95
Amiga 3D Graphics in BASIC	£16.95	Best of Tricks & Tips	£24.95 (d)
Amiga Applications	£16.95	Elementary Amiga BASIC	£12.95
Amiga Assembly Language Prog	£12.95	F15 Strike Eagle Handbook	£10.95
Amiga BASIC Inside & Out	£18.95	Falcon Air Combat	£12.95
Amiga C for Advanced Prog	£29.95	First Book of Amiga	£14.95
Amiga C for Beginners	£16.95	Get the Most out of Amiga	£9.95
Amiga Companion	£14.95	Getting the Most from Amiga	£9.95
Amiga Desktop Video Guide	£16.95	Gunship Academy	£10.95
Amiga Desktop Video Workbook	£29.95 (d)	Inside Amiga Graphics	£14.95
Amiga Disk Drives Inside & Out	£24.95	Jack Nicklaus Computer Golf	£10.95
Amiga DOS Inside & Out	£16.95	Kids & The Amiga	£13.95
Amiga DOS Quick Reference	£8.95	Leisure Suit Larry Story	£11.95
Amiga for Beginners	£12.95	Making Music on the Amiga	£29.95 (d)
Amiga Graphics Inside & Out	£29.95	Mapping the Amiga	£19.95
Amiga Hardware Ref. Guide	£21.95	Mastering Amiga C	£19.95 (d)
Amiga Kernal ROM: Includes	£28.95	Mastering AmigaDOS 2 Vol 1	£21.95 (d)
Amiga Kernal ROM: Libs & Divs	£29.95	Mastering AmigaDOS 2 Vol 2	£17.95
Amiga Machine Language	£14.95	MC 68000 Prog. Ref.	£8.95
Amiga Printers Inside & Out	£29.95 (d)	More Tricks & Tips	£14.95
Amiga System Prog. Guide	£29.95	Official Book of Kings Quest	£9.95
Amiga User Interface Style Guide	£19.95	Programming the 68000 (Sybex)	£22.95
Amiga Vision Handbook	£22.95	Screen Play	£9.95
AmigaDOS 2 Companion	£22.95	Second Book of Amiga	£14.95
AmigaDOS Ref Guide 3rd Ed.	£18.95	Using Delux Paint 2nd Ed	£19.95

(d) – includes disk Send SAE for our new descriptive catalogue

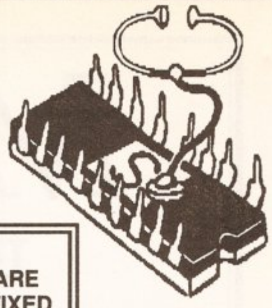
Free delivery in UK and Europe and surface mail worldwide. Add 30% for airmail outside Europe. Access & Visa accepted

DTBS (ASH 11)
18 Norwich Avenue, Rochdale, Lancs OL11 5JZ
Tel/Fax 0706-524304

TROUBLESOME FAULTY AMIGA?!!

Quality Amiga Repairs

From only £23.50



FOR SPEED, FREE POSTAGE INCLUDES FREE PIECE OF SOFTWARE + PEACE OF MIND CALL FOR OUR FIXED PRICE OFFER ANYWHERE IN THE UK!

Amiga Upgrades Fitted

Shop 10,
Bridge Park,
Harrow Rd,
Brentfield,
London
NW10 0RG

Access

Ring Repairs Hotline
STAR ASSOC. Computers
Wembley 081 961 5366/4412

VISA

For computers & accessories....... RR **where you CAN buy more for less**

DISKS, HIGH QUALITY WITH LABELS	
3.5" DSDD, blue	33p
3.5" Sony, branded	68p
3.5" 3M, branded	75p
DISK STORAGE BOXES	
3.5" 40 capacity, locks	£4.45
3.5" 80 capacity, locks	£5.45
3.5" 100 capacity, locks	£5.95
ACCESSORIES	
Amiga external drive	£55.95
0.5Mb upgrade	£24.95
0.5Mb upgrade, clock	£28.95
Amiga replacement mouse	£17.50
Naksha upgrade mouse	£23.95
Universal printer stand	£5.95
Tilt/turn monitor stand	£10.95
Mouse/joystick extension	£4.95
4-player extension lead	£4.95
Joystick splitter lead	£4.95
Fastrack disk swap box	£2.95
Mouse mat, 6mm	£1.95
Disk head cleaning kit	£1.95
3.5" 100 disk label pack	£1.50
Amiga dust cover	£2.95
Zipstick autofire joystick	£10.95
Quickjoy Supercharger III	£8.95
Quickjoy Topstar	£19.95

Ask for computers & joysticks list
....and now a FREE PD Catalogue disk.

Cheques/PO's to: REDLAW RESOURCES,
ASH Offer, 74 Durban Road, Patchway, Bristol, BS12 5HQ.
Please add £3.50 for p&p.
Tel: (0272) 760600 (24 hour)

Access VISA

GFA Basic 3.5 Interpreter. Now for the Amiga.

~~£50.00~~ £25.00

GFA
Data Media UK

Programming environment editor
Structured programming support
Auto indent
Procedure folding
400 page User Manual
Variable types: Boolean, Byte, Integer, Float, String
System Library supported
Over 300 Commands supported

In support of Amiga Shopper's new programming tutorial series for GFA-BASIC, ...a very special offer.

GFA-BASIC code created on your Amiga will also run on the Atari ST, MS-DOS and WINDOWS 3.0, with little or no change.

GFA Data Media
Box 121
Wokingham
Berkshire, RG11 5XT

Tel: (0734) 794941

Available by mail order from:

GFA Data Media (UK) Ltd, Box 121, Wokingham, Berkshire, RG11 5XT.

Credit card or cheque/postal orders payable to GFA Data Media (UK) Ltd accepted.

VISA

MasterCard

I wish to pay by Visa/Mastercard; please charge my account.

GFA Basic Interpreter Amiga £25.00 ☐

Card No:

Signature

Expiry Date

Name (on card)

Address

Postcode

AMIGASHOPPER1

Shopper Reader Ads

Now you can reach thousands of fellow Amiga owners for only £5

FOR SALE

Amiga A500 plus 1084S monitor plus external floppy drive, joystick and games £520. ☎ 0276 600165.

Amiga 500, 512K RAM expansion with clock, Workbench 1.3, A590 20Mb HD with 1 meg of RAM, loads of software, manuals £500 ono. ☎ Tom anytime 5-11pm 08642 677632.

Tandy WP-2 portable word processor (see Amiga Format no 16). £150. ☎ 0782 415186.

Baseboard expansion RAM for A500 6 meg fully populated £190. Also A590 hard drive with 2 meg RAM fitted £250. ☎ Bob during day (0375) 375811 evenings (0375) 379795.

Dowety Quattro Modem V22bis V22 V23 V21 full duplex operation, autoanswer, autodial, autobaud constant speed interface, Hayes compatible. Cost £575 will accept £180. ☎ 0706 622135.

MPS1550C Amiga colour printer cost £249 still boxed with cable, and extra ribbons, used twice. Will accept £199. ☎ 0706 622135 Heywood/Rochdale.

Taxan full width professional dot-matrix printer NLQ tractor feed. Excellent value of £199. ☎ 0706 622135 for details Heywood/Rochdale.

A1500 hardware six months old plus Philips monitor, and Star LC-200 colour printer. Spreadsheet, D-Base, graphics and Pro-Page V2.0A DTP software. Games also available. ☎ Weybridge, Surrey on 0932 846360.

Amiga 1Mb, manuals, Workbench. Recently overhauled. No software, but you get my phone number for any help needed! £250 only. Also B12 clarinet £180. ☎ 0298 812906.

Amiga 500 plus five years insurance and RAM expansion with clock many software titles, ZX Spectrum and 128K with software and Datassette mouse mat for Amiga and dustcover. ☎ 081-541 1319.

Citizen Swift printer. 24-pin dot-matrix, fitted colour kit, 32K RAM buffer upgrade fitted. Includes manual, leads for Amiga, black/colour ribbons. Rarely used. £200. ☎ 0296 81881, Evenings.

Devpac II for sale plus two Amiga reference manuals. All worth £100, selling for £60. Totally unused. Unwanted gift. Very good condition. Fully boxed. ☎ Mark Peacock 0245 75367.

Amiga A500, 512K RAM and clock, mouse, joystick, TV modulator, Philips colour monitor, collection of games, books, all in good condition £450. ☎ Andy on 0903 203906 evenings and weekends.

Star LC-10 printer, leads for Amiga, spare ribbon, boxed, in good condition, £110. ☎ Andy on 0903 203906 evenings and weekends.

Epson LX86 printer with tractor unit, cut sheet unit, 14 ribbons, approx 500 sheets continuous paper and cable. Cost £348. Will sell for £180 ono. ☎ Tony, evenings 0923 229779.

Yamaha PSS-680 synthesiser, 100 rhythms, 100 voices, digital synthesiser makes thousands of different voices, drum pads, manual, MIDI cable, mint condition, as new £150 ono. ☎ Tony, evenings 0923 229779.

Prodraw2 boxed, complete. £65 or W.H.Y? ☎ 0252 511352 after 6pm.

Hard drive for Amiga A500 autoboot 50Mb Amdrive £300. 3.5-inch external drive £50. ☎ Neil 071-474 4019.

Rendale 8806 for Amiga 2000, the pro unit for desk top video, also MX10 mixer £400 each or £750 for both items. ☎ 0920 821003 after 6pm.

Swap 386 SX PC 42Mb HD 2 megs RAM VGA colour monitor mouse software for Amiga 2000 with 40Mb HD XT BB software. Contact Mark ☎ 040377 545 West Sussex under guarantee.

Amiga 2000 including colour monitor. Excellent condition. Only £595. ☎ 0273 208132.

A500 Workbench 1.3 2Mb RAM all manuals boxed £250. Commodore A2058 RAM board 2Mb installed unopened £170. Power Computing 5.25/3.5 dual drive external power, all leads software boxed £100. ☎ 0772 633593.

The Datel Pro-Sampler II stereo sound sampler + Datel Jammer. Brand new with software and manual. For only £50. ☎ Paul Linsell on 0427 612733.

Amiga A1000, Stereo monitor, 2nd drive, 1.5Mb, MIDI Interface with software. Can be fitted with internal hard drive. Bargain at only £495 for such a quality machine. ☎ 0209 216088.

X-CAD Designer draughting program £45. ☎ Bodmin 0208 851105.

Amax II Macintosh emulator plus those oh-so rare ROMs! £200. Also ICD flicker free video card (for use with multisync monitor) as new £190. ☎ 0983 853942 right now!

Deluxe Productions £50, Deluxe Video (PAL) £30, Comic Setter £25, Fantavision £15, Rainbow Island £5. ☎ Cliff 0532 403285 after 6.00pm or 0532 713021 between 8.00am - 5.00pm.

FANZINES

Send £7 and receive 80 pages (A4) filled with hints etc for more than 200 Amiga 500 games and programs. Write to: John Nielsen, Malov Hovedgade 132, DK-2760 Malov, Denmark.

PERSONAL

PD to swap on a one to one basis. Please write with SAE Mr C Parker, 258 Marlborough Road, Swindon, Wilts SN3 1NR.

PD swappers wanted to swap one for one, many titles. Please send list plus SAE to Robert Blazye, 40 Constance Crescent, Hayes, Kent BR2 7QJ. Wanted cheap Vidi Amiga (around £20).

HAM-E owners wanting to swap ideas and/or graphics for this amazing system. Contact Jason at 19 Stirrup Way, Pound Hill, Crawley, W Sussex, RH10 7RH.

Digitising service. Do you need your holiday snaps etc digitised? If so send a blank disk for details/samples to S M Doe, 58 Winchester Road, Colchester, Essex, CO2 7LH. Enclose return address.

Only £5 to sell your used hardware and software in Amiga Shopper

Sell your excess hardware and software with Amiga Shopper Reader Adverts. Just fill in the form and send it to us along with a cheque (made payable to Future Publishing) or postal order for £5. But **BE WARNED**. This magazine is not a forum for selling pirate software or other illegal goods. Software must include all issue disks, manuals and a signed statement that all other copies have been destroyed. Please advise us if you are offered pirate or copied software by advertisers. All ads are accepted in good faith. The editor reserves the right to refuse or amend ads. We accept no responsibility for typographical errors or losses arising from the use of this service.

Trade ads will not be accepted, including anyone advertising the sale of PD software.

Name .... **Issue 7**

Address (not for publication) ....

....

Postcode ....

Date ....

Tel ....

Tick one box to show required section heading

For sale .....☐

Wanted .....☐

Personal ....☐

Fanzines ....☐

Use one space for each word. Only the words in this section will be printed.

Return with your cheque to: Reader Ads, *Amiga Shopper*, 30 Monmouth Street, Bath, Avon BA1 2BW

Unfortunately we cannot guarantee insertion in a particular issue.
I have read and understood the conditions for the inclusion of my ad.

Signature ....

Find your local group

If your group isn't mentioned, fill in the form at the bottom of the page to let us know about you

1520 Plotter Group (ICPUG) Contact John Bentley ☎ 06286 65932.

Amiga Artists Club 34 Roundhay Mount, Leeds LS8 4DW. A club for Amiga artists, musicians and coders for mutual assistance and programming demos. No pirates, genuine Amiga artists only. Membership is free, contact KAM on ☎ 0532 493942, 5pm-8pm.

Amiga Beginners' Club 110 Whitehill Park, Limavidy, Co. Londonderry, BT49 0QG. A club to help newcomers to the Amiga. There is a bi-monthly club disk, and a small PD library. Membership costs £2 for a single disk, or £20 for every issue.

Amiga Musicians' Club Membership gets you a disk with 50 IFF samples a month for 12 months. Also sample service. Membership £30. Contact Gavin Wylie, Guthrie Street, Carnoustie, Angus.

Amiga Users Klub, Windsor House, 19 Castle Street, Bodmin, Cornwall PL31 2DX. Meets every Friday from 6.30-9pm, to expand members' knowledge of Amiga computing and to help solve people's problems. Contact Jack Talling.

Amiga Witham Users Group 85 Highfields Rd, Witham, Essex CM8 1LW. Distributes tips and Basic programs. Keith Anderson ☎ 0376 518271.

Amigaholics Club For beginners and some experts. Free membership. Own disk magazine. Contact Kevin Bryan ☎ 071-580 2000 Ext 240 or write to 29 Wolfe Crescent, Charlton, London SE7 8TS.

Anglesey ICPUG Meets every Monday 6pm-9pm at Holyhead Unemployed Workers Club. All machines from C64 to Amiga. Contact Nick Massey ☎ 0407 765221.

Ayr ICPUG Meets at Radix Training Centre, West Sanquhar Road, Ayr. Contact John Smith ☎ 0292 261408 Ext 202.

Basic Programmers Group 68 Queen Elizabeth Drive, Normanton, West Yorkshire WF6 1JF. Set up to encourage the use of Basic, exchange ideas and assist beginners to the language. Free newsletter from Mark Blackall ☎ 0924 892106.

Bury St. Edmunds ICPUG Contact Alan Morris ☎ 0359 51446.

Buxton ICPUG Contact Peter Richardson ☎ 0298 23644.

Chester-le-Street 16 Bit Computer Club Conference Room 2, The Civic Centre, Newcastle Road, Chester-le-Street. The club meets every Monday from 7.30-9.30pm to see each others' software collections, exchange advice and swap tips. Contact Peter Mears ☎ 091-365 2939.

Club Amiga 5 Bowes Lea, Shiney Row, Houghton Le Spring, Tyne and Wear DH4 4PP. Membership costs £15 a year for a disk magazine, PD software and a 24-hour telephone helpline service (091-385 2627). For more information send an SAE to Chris Longley.

Computer Club 16 Laton Road, Hastings, East Sussex ☎ 0424 421480. This is a 16-bit club dedicated to being computer enthusiasts without being pirates. Membership costs £15 per year, and the club has arranged discounts with several local firms.

Coventry ICPUG Meets on the first Wednesday of the month. Bring your computers. Contact John Orange ☎ 0203 689635.

Disabled Group (ICPUG) Contact David Bate, 71 Bedford Road, Bootle, Merseyside L20 7DN.

Dublin ICPUG Meets fortnightly on Fridays (except August) at St. Andrews College. Covers all Eire, 36 page newsletter. Discounts arranged. Contact Geoffrey Reeves ☎ 010 353 12 883863.

Dundee ICPUG A new group which hopes to meet at Bits and Bytes, 21b Commercial Street, Dundee. Contact Dave Thonton ☎ 0382 505427.

Edinburgh Amiga Group Membership £5, includes free advice and PD. Contact Neil McRea, 37 Kingsknowe Road North, Edinburgh EH14 2DE with SAE.

Edinburgh ICPUG Contact Martin Lowe, Amiga Centre Scotland ☎ 031-557 4242.

Genealogy Group (ICPUG) Contact Steve Turner, 27 Burley Close, London SW16 4QQ.

Imagine Users Group To encourage use of Imagine and other ray tracers. Affiliated to US group. Object library. Membership free. Contact Brian Walker, 16 Cambridge Road, Newton Cambridge CB2 5PL.

Independent Commodore Products Users Group Biggin Hill Library, Church Road, Biggin Hill, Kent. Meets most Thursdays from 7.45-9.45pm. There are lecture nights and open nights where members can get help. See also regional entries. Contact John Bickerstaff after 8.30pm ☎ 081-651 5436.

Macclesfield ICPUG Meets at The Harlequin Club, Chestergate, Macclesfield, every Tuesday from 8-11pm. Contact Peter Richardson ☎ 0298 23644.

Mid-Thames ICPUG Meets at Cox Green Community Centre, SW of Maidenhead, on the second Thursday of the month at 7.30. Open nights and some talks. Newsletter. Contact Mike Hatt ☎ 0753 645728.

Public Domain User Group Swaps PD between members, provides advice and reviews of PD. Basic membership free, advanced £3 per year for newsletters and price reductions. SAE to 12 Oxford Road, Guildford, Surrey GU1 3RP.

Slim Agnus 115 Brocks Drive, North Cheam, Sutton, Surrey SM3 9UW. Meets on the last Thursday of the month. PD library, bulletin board, advice from Amiga experts. Contact Philip Worrel.

Software Exchange Service 13 Bournville Lane, Stirchley, Birmingham, West Midlands B30 2JY. Offers a forum for exchanging old, unwanted games for a small price. Contact Michael Pun on ☎ 021-459 7576.

Solent ICPUG Meets at GEC Aerospace Sports and Social Club, Titchfield, Hants, first Tuesday of the month at 7.30. Open nights and some talks. Contact Anthony Dimmer ☎ 0705 254969.

South West ICPUG Meets second Sunday of the month at Queens Arms Hotel, Charmouth, Dorset, at 10am. Bring your computers. Some talks. Contact Peter Miles ☎ 0297 60339.

Stevenage ICPUG Meets at Hertford Road Community Centre, Stevenage, last Friday of the month at 7.30pm. Contact Bob Grainger ☎ 0438 727925.

The Pennine Amiga Club 193B Oakworth Road, Keighley, West Yorkshire BD21 1RE. Offers free membership, free advice, and circulates a newsletter. Contact Simon Booth ☎ 0535 600437.

Watford ICPUG Long standing club with friendly atmosphere. Meets third Wednesday of the month, 7.30pm St Thomas Church Hall, Watford. Membership £12. Contact Rod Eva/Mark Pryor ☎ 0923 50161.

West Riding ICPUG Meets at the White Horse Inn, Fall Lane, East Ardsley, Wakefield, first and third Tuesdays at 7pm. Open nights. Minibus to London shows. Contact Kevin Morton ☎ 0532 537318.

Wigan ICPUG Contact Brian Caswell ☎ 0942 213402.

Wrexham District Computer Club PD, library of books, equipment loan. 10p to join, plus 50p to get in. Held in Memorial Hall, Wrexham every Thursday, 7-10pm. Contact Paul Evans, 3 Ffordd Elfed, Rhosnesi, Wrexham, Clwyd LL12 7LU.

GET YOURSELF LISTED

If you run a user group which isn't listed on this page, fill in the form below for your free entry. Send it to *Amiga Shopper* User Groups List, 30 Monmouth Street, Bath BA1 2BW. We reserve the right to refuse entries.

Group name ....

Contact name ....

Contact telephone number ....

Contact address ....

....

....

Place of meetings ....

....

Time of meetings ....

Type of activities ....

....

....

Membership fee ....

Software for free



"Here we are again, looking at the best in shareware and public domain software."
Phil South

Phil South undertakes his monthly journey into the public domain, where all software is (nearly) free

Welcome back to the world of PD. There are some very nice pieces in the postbag this time round. After a few dry months without any really good utilities in sight, I turn around and I'm up to my user port in compilations of the best utils around. And Fred Fish disks are being shifted by a lot more people too, with a number of houses carrying the whole Fred Fish range, which if my intelligence is correct numbers over 500 disks now. This could have something to do with the Fred Fish CD-ROM that has appeared in recent months; any software house can now get a CD drive and a disk containing the first 400+ disks all in one place in an easy-to-duplicate package.

Graphics slideshows, far from being old hat and past it, are also coming back with a bang, and this month I got no less than 14 sent to me which, as I don't get everything that comes out, means that there must be even more out there. The good news is that they are better quality these days, and as well as being very entertaining – especially the likes of the *Aliens* demo – they serve as handy bits of clip art, albeit sometimes of slightly dubious copyright clearance. Or taste, it seems, as 'nude girlie PD' continues to flourish unabated since the recent exposés in the computer news media. There are certain obvious reasons for this: most people involved in PD are male, single and between 15-25 and so love this sort of thing to death. OK, I admit it, some of it is quite nice, but it bothers me slightly that kids can amass huge collections of nudes (and more sinister pics and animations) very easily on innocent-looking disks that their parents can't access easily. If the parents don't know how to operate computers then they can't find the porn, right? For the over 18s it's none of our business, but who is to say that this stuff isn't being sold to children? I don't know the answer, and you certainly can't restrict access to materials of an erotic nature without constraining artistic and personal liberty. So, a knotty question, and one I'll leave you to ponder while we kick into review mode and boot up this month's collection of PD disks.

And by the way, before we begin I'd just like to mention two things:

1. I'll generally mention the author of a piece of software where known, as I think it's important to acknowledge that they are the author, and that these bits of software don't just write themselves.

2. Normally I'll give you the number of a PD disk according to whatever vendor I get the program or disk from. If the program has no number, you have to ask for it by name from the PD house mentioned.

Right, then, let's go...

UTILITIES

ANTI VIRUS TOOLKIT
Electriclown 01

The ultimate deterrent from the Electriclown stable. Updated from the original version of this disk, it contains all the virus killers you'll ever need, including up-to-date versions of *BootX*, *Master Virus Killer*, *VirusX*, *Zero Virus* and *Virus Check*. Some are resident, some are programs you run just to check your disks at any time. This is a good collection, although I'd argue for the inclusion of the Pseudo Ops *VK* program, which is so totally resident it changes the startup screen on your Amiga from a blue to a red disk and plays some music. Now that's what I call getting in before the milkman!

Value for money 8/10

DISK UTILS
Electriclown 11

A standard collection of the most useful disk utils you will need from time to time. These are not programs you use all the time, with the exception of *SID*, but if you ever have a hard disk go down or a floppy which goes bye-byes, you'll be glad of the tools in this kit.

The disk contains *FixDisk*, *Format*, *DiskSpeed*, *MRBackup*, *Showdisk*, *SID* and *Zap*. *FixDisk* is one of the most user-friendly disk salvage programs around: if you accidentally delete or scramble any part of any sort of disk, you may well be able to recover it with this program. *MRBackup* enables you to back up your hard disk, in case the unthinkable should happen. If you store a lot of data on your hard disks I recommend that you back up at least once a week – that way you lose only a week's worth of work, rather than a whole year's. We tend to think of hard disks in general as being very robust, and they are, but many people have horror stories about Amiga HDs which don't just crash, they practically self-destruct. And although I've never had a problem with my hard disk, I'm still a paranoid backup frenzy merchant, due to complete screw-ups with floppies. A floppy can store up to about 150,000-200,000 words, and if that goes down you've lost a lot of work. So imagine how much your average hard disk has on it...

And finally there is *SID*, one Amiga program which I for one use every single day without fail. Although it's a simple directory utility at first glance, it has features which allow you to examine, erase and rename files, hear sound samples, view picture files and check the format of almost all the files you have on any device. It's one of the most versatile programs you can own, and cuts down a lot of work. The only thing is that once you've used it on your machine, it's extremely hard to function without it.

Value for money 9/10

C PROGRAMMING UTILS
Electriclown 19

A bunch of utils for the C programmer, which will only make any sense to you if you know that language. On the disk are copies of

continued on page 142

BEGINNERS START HERE

Software for free? How's that then?

This may sound like a call to piracy, but public domain software is free to anyone. Yes even you sir, you at the back with the Jolly Roger. There isn't any catch, unless you count the fact that there is so much PD software on offer that it's hard to choose what you're going to have. And that's where I come in.

But what does PD mean?

The public domain concept is borrowed from the early days of mainframe systems, where enthusiasts (called 'hackers' then, before the word had less pleasant connotations) produced programs and distributed them to their friends and fellow hackish types, asking for no payment but the glow of being recognised as a truly hackish coder. The copyright was waived by the author, and so the program was said to be in the public domain – that is to say, any member of the public had a right to copy and use the program however they wished, provided that the author's credit and any relevant documentation was distributed with the program.

So how can I get hold of all this wonderful free PD?

Either buy it from a PD library (see page 150 for a list) or, if you've got a modem, download it from a bulletin board. These are computers with modems, which anyone can use a phone and modem to log on to, download a lot of demos and utilities, leave a few messages and programs of their own and log off. You'll find that there are many bulletin boards with Amiga files available for download.

Send your order to :
CRAZY JOE'S
DEPT. AS11
145 EFFINGHAM ST.
ROTHERHAM
SOUTH. YORKSHIRE
S65 1BL
Please make cheque / p.o. payable to "CRAZY JOE'S"

Crazy Joe's

We take your fun seriously!

CREDIT CARD HOTLINE
(0709) 829286
FAX ORDERS
(0709) 878308
MINIMUM CREDIT CARD ORDER £3
24 HOUR SERVICE

Amiga Public Domain Software

KEY TO ABBREVIATIONS : (2) = Number of disks in set; * = 1 meg; ** = 2 meg; (2D) = 2 drives; (X) = Adults Only

DEMOS / ANIMATIONS

298 Unicycle Animation *
399 NewTek Demo 3 (2) *
483 Elvira Demo
646 Predators Megademo (2)
744 Red Sector Cebit Demo
747 Popeye Meets The Beachboys
773 Shark Animation *
825 Budbrain Megademo (2)(X)
853 Dragons Lair Demo *
865 Coma Demo
895 Trip To Mars
897 Scoopex Mental Hangover
906 Madonna Cartoon Animation *
954 Turtles Demo
1001 Station at Khern (3) **
1033 At The Movies Anim **
1105 Crionics Neverwhere Demo
1188 Fillet The Fish
1200 Raiders of the Lost Ark Anim *
1229 Budbrain 2
1238 Evil Dead Demo (X) *
1453 More Aerotoons *
1540 Amy .vs. Walker Anim *
1541 Batman Animation *
1551 Too Much 3D *
1552 Magician Animation V2.0 *
1560 Phenomena Enigma Demo *
1628 Do The Bart, Man *
1650 Crionics : Total Destruction *
1664 Silents : Blue House (2) *
1667 More Classy Animations *
1692 Basketball Animation *
1701 Tron Animation (2) *
1703 Total Respray
1704 Total Recount
1705 Total Restyle
1706 Total Retrial
1707 Decay : Simpsons Demo *
1753 Life Of Brian (2)
1766 Laurel & Hardy (2)(2D) *
1775 Total Confusion *
1782 Carrott : The Chicken (2)(2D)
1784 Carrott : Insomnia (2)(2D)
1818 Darkness Megademo 2 *
1820 Magnetic Fields Demos 92
1823 N-n-n-n-nineteen Demo
1833 Agatron Animations 33
1834 Agatron Animations 34
1837 Plasmutex Demo
1838 Global Trash Demo
1841 Anti-Lemmin' Demo (2) **
1843 Phenomena Interspace
1844 Goldfire Megademo
1845 Timex Demos *
1846 Enterprise Animation (2)(2D) *
1850 The Wall (6)(2D) *
1856 Betty Boo Anim / Slideshow
1877 AMOS 3D Demo
1881 Mike Tyson Knockout Disk
1885 Robocop Animation *
1892 Shuttlecock Animation *
1900 Silents : Ice Demo
1902 Tomsoft: Virtual World
1923 Star Wars Demo (2)(2D) *
1928 Demo Dolly Pack 4 *
1929 Vector Dance
1943 Windsurfer Animation (2) *
1947 Mr Potato Head *
1948 Mr Potato "Chips Are Up!" *
1950 Super Woman Animation *
1956 Creature Comforts Demo

GAMES

315 Return To Earth
496 Holy Grail Adventure *
498 Wanderer
648 Star Trek (USA) (2) *
680 Learn & Play (2)
727 Star Trek (Richter) (2)
766 Treasure Hunt
957 Pipeline
962 Drip!
987 Snakepit
991 Jeopard *
1004 Games Disk 9
1113 Wet Beaver Games
1230 Dragon Cave
1245 Rings Of Zon *
1408 APD59: Super Quiz
1411 APD62: Arcadia
1510 Pick Up A Puzzle (2) *
1512 Picture It (2) *
1517 APD110: Crossfire *
1520 APD115: Balloonacy
1528 APD130: The Wooden Ball *
1531 Simon Says / Space Maths
1532 APD137: Tile Trial *
1533 The Jar *
1539 Megaball *

GAMES PACK

37 titles on 8 disks
Including Asteroids, Sys, Tiles, Bally 2, Pool, YachtC, Invaders, H-Ball, Fruit Machine, Block Off, Shoot Out, Peter's Quest *, and many more!
8 DISK SET ONLY £8.00

1544 Seven Tiles
1558 Adventure Solutions (2)
1573 APD142: Pair Crazy
1577 APD146: Fruit Machine *
1579 APD148: Demolition Mission *
1580 APD149: Gobbit / Pontoon *
1584 APD153: Missile Command
1591 APD160: Quizmaster *
1608 APD178: Mastermind/Pair Up *
1610 APD180: Dungeon Delver (2)
1612 APD182: Pixie Kingdom (2)
1668 Tomtespelet
1670 Wheel Of Fortune
1690 Hints Disk One
1700 Terror Liner 2 (X)
1711 Mental Image Games Disk 1
1715 Frantic Freddie
1720 Cabaret Asteroids
1746 Word Games Volume 1 *
1747 Word Games Volume 2 *
1748 Strategy Games *
1749 Truckin' (2)(2D)
1780 Arcade Game Cheats 1
1790 Serene 2
1827 Scum Haters
1832 Pom Pom Gunner *
1879 Sea Lance *
1882 S.E.U.C.K. Simpsons Game
1883 Bionix II *
1905 J Nicklaus Course Disk 1
1916 Air Ace II
1926 Napoleonic Warfare System *
1945 Island of Nephotons Adventure
1949 Dungeon Master Companion

MUSIC

052 Awesome Sounds
057 PSB : Suburbia
061 Definitive J. M. Jarre
087 Power Surge
109 Amiga Chart 3
166 Vangelis *
187 Crusaders : Audio X
204 Sound Atax 2
237 Zee's Hip Hop Music
407 CD Player Demo *
409 Crusaders : Freek'd Out!
418 Electric Youth (2)
497 Amiga Chart 5
552 Music Invasion 3 (2)
654 Powerlords : Power Musix 2
700 Digital Concert IV
713 Flash! - Queen
722 Beatmaster Club Mix
724 Technotronic Remix
746 Crusaders : Bacteria
824 Digital Concert V
858 Sonix House
866 Pan 3 Music Disk
914 Special Brothers Music 2
935 Madonna : Hanky Panky
940 Hooked On Sonix
941 Soundtracker Jukebox
969 100 C64 Games Tunes
970 The Comic Strip Remix
976 Scoopex : Beast Sonix

SOUNDTRACKER SPECIAL

Make your own music on the Amiga! This pack includes the programs, songs, modules and instruments - enough to get you started and keep you going for hours!
8 DISK SET ONLY £8.00

986 Amaze : Revolutions
993 PSA Music Demodisk 1
1026 Digital Concert VI
1107 Stop Right Now! *
1292 Crusaders Does Genesis
1630 Accession : Sun Wind
1685 Depeche Mode Music Disk
1694 Art Of MED Music Disk
1695 Seal : Crazy Remix *
1698 SDFC : Sounds Dr Digital
1713 Spaced Out Vol. 1
1714 Spaced Out Vol. 2
1716 I Think We're Alone Now
1717 Everybody Dance Now
1718 Betty Boo : Doing The Do
1755 Amazing Tunes 2 (3) *
1763 Aamond Gallant Knight (3) *
1772 Taipan Music Disk (2)
1776 Crusaders : Sheet Music
1777 Beatmasters : Technology
1787 Magnetic Beats 2
1788 Magnetic Beats 3
1821 Academy Music Collection
1822 Brainstorm : Best Of Grubl
1824 SCR Musax 2
1828 Sgt Pepper Revisited (2)(2D) *
1831 Vega Music
1921 Computer World Music 3 *
1927 Here Comes The Hammer

SLIDESHOWS

030 J.O.E. Slideshow 2
078 Vallejo Fantasy Art (2)
084 Mega Art Disk
163 NASA Slideshow
167 DigiView Slideshow
171 Patrick Nagel Pictures
185 Escher Slideshow
238 TV Sports Basketball
282 Forgotten Realms
299 Roger Dean Slideshow
357 Max's Art Disk 1
411 Photofile Portfolio (2)
572 Utopia : Photomontage 1
573 Utopia : Photomontage 2
617 Neighbours Slideshow
725 Diggy Piggies (2)
742 Madonna Slideshow
767 Cinemaware Slideshow
776 Exodus Real 3D
814 Viz Slideshow
831 Utopia Cartoon Slideshow
832 Utopia : Photomontage 3
863 Scream Queens (2)
878 Sun Slide III
891 Creepshow
899 Madonna Slideshow 2 (2) *
915 Apol's Digishow *
931 Heroic Dreams
942 Garfield Slideshow
968 Gorezone Slideshow (X)
1044 Desert Island Slideshow
1051 Total Recall Slideshow

GLAMOUR DISKS

For a full list send a stamped addressed envelope to :
BLUE MOON
P.O.BOX 123
WATH-UPON-DEARNE
ROTHERHAM
S63 7DW
Please include a statement saying you are over 18
(Blue Moon are not connected with Crazy Joe's in any way)

1062 Golems Gate
1073 Fraxion Fantasy
1082 Annie Jones (Neighbours)
1085 Comic Slideshow (X)
1103 Girls Of Sports Illustrated
1210 Turtles Slideshow
1263 Crusaders : Richter (2)(2D)
1272 Nemesis : Prologue
1277 Fraxion : Divine Visions (2) *
1279 Forgotten Realms '90
1475 Nemesis : Chapter 1 (2) *
1480 The Age Of Slack
1523 Nik Williams Demo
1546 SkyWalker Digishow 1
1547 SkyWalker Digishow 2
1581 Demons Slideshow 3 *
1666 Mages Staff
1708 Invisible World Slideshow
1719 Yabba Dabba Cartoons
1781 Reflections Ray-Traced
1835 Night Breed Slideshow
1849 Film Posters Slideshow
1876 Reflections Ray-Traced 6
1901 Leeds United Slideshow
1919 Debbie Harry S/show (2)(2D) *

UTILITIES

081 UEdit Word Processor
119 Amiga MCAD
180 PageSetter Clip Art
210 Icons!
259 Ultimate Bootblock Coll. (2)
346 TV Graphics (2)
353 Showiz 2.0 (SS maker)
410 DPaint Cartoon Brushes
442 DPaint Fonts Disks (4)
458 HAM Radio Utilities (5)
546 Iconmania!
571 Jazzbench
580 Dope Intro Maker
591 Business Card Maker
595 Amateur Radio Disk
632 MSH (MessyDOS)
642 C Manual
661 Programming Disk
682 Sound Applications (2)
684 Video Applications (2)
697 Graphics Management (2)
901 The Comms Disk
902 QED Text Editor
1071 NoisePlayer V3.0
1079 Prophecy : Coder Mag 1
1095 Database Workshop (2)
1097 DPaint / PageSetter Clip Art (2)
1099 Video Graphics (4)

HOME BUSINESS PACK

A suite of programs for those who want to dabble on the serious side of computing : Nag, Bank'n, Journal, QBase, Spread, Wordwright, AmigaSpell, Inventory, MemoPad and more!
8 DISK SET ONLY £8.00

1117 Geneaology *
1225 Hardware Projects Mag
1228 ST Emulator (German)
1234 Tetra-Copy
1273 C-Light
1450 Virus Superkillers
1451 ElectroCAD
1452 AmiBase
1535 Master Virus Killer V2.0
1536 North C (packed)
1537 North C (unpacked) (2)
1545 SpectraPaint V3.0
1550 FlexiBase V2.0
1569 APD138: Language Tutor
1606 APD176: Database Master 2.0
1629 ZX Spectrum Emulator
1663 Dynamite Cut 'n' Paste Fonts
1858 Demolishers : 202 Utilities!
1878 Textplus Shareware WP
1880 DCopy & Utilities
1884 Equinox Intro Writer *
1886 MED V3.1
1893 DICE V2.06A
1896 Desk Bench (3)
1908 PageSetter Clip Art (8)
1914 Slideshow Construction Kit
1942 Master Virus Killer V2.2
1951 King James Bible (3)
1954 Celtics Demo Maker
1960 RSI Demo Maker (English Doc)
1961 RSI DM Utility/Help Disk
1962 TSB 3D Vector Designers V1.1

These are just a few of the many disks in the library. For details of the others send 50p for our **CATALOGUE DISK** which also contains a FREE game!

PUBLIC DOMAIN PRICES

1 - 9 disks
@ £1.25 ea.
10 or more
@ £1.00 ea.
Price is per disk NOT per title

BLANK DISKS, DISK BOXES & ACCESSORIES

BLANK DISKS		DISK BOXES	
10 disks	£4.99	10 capacity	99p
50 disks	£22.50	40 capacity	£4.99
100 disks	£39.99	50 capacity	£5.99
150 disks	£54.99	80 capacity	£6.99
200 disks	£69.99	100 capacity	£7.99

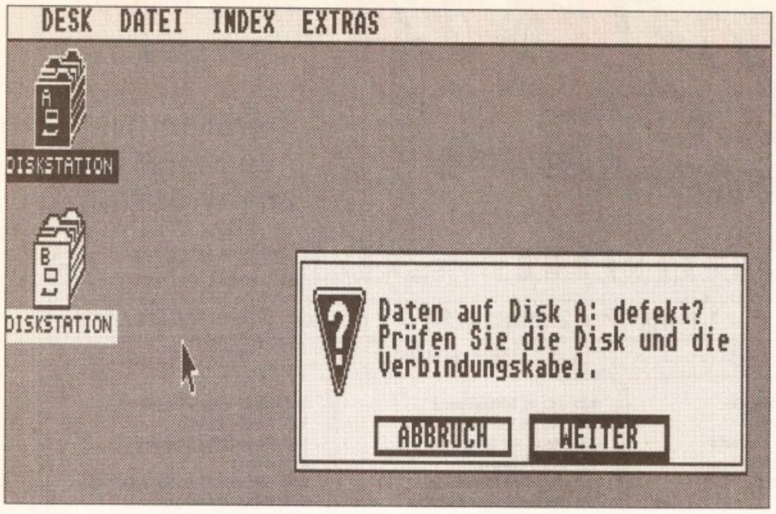
PLEASE NOTE PRICES MAY DIFFER FROM OUR SHOP PRICES

We now stock
Deja Vu
Licenceware
Priced @ £3.50 per disk
(2 disk sets @ £5.50)
Full details of titles on our catalogue disk

POSTAGE

UK,.Channel Isles....FREE
OVERSEAS AIR MAIL
Europe, Eire ... £2.50
Rest of World ... £4.00

Please note that payment must be in Sterling



Emulate an ST with the *Quantum and Tempest* disk.

continued from page 140

the utils *BI*, *Calls*, *Cref*, *Err*, *GetSprite*, *Icon2C*, *Image Editor*, *Indent*, *Libcounter* and the *Textra* text editor.

Icon2C takes an Amiga icon and turns it into C source code. Why you'd want to do that is little unclear, but it does mean that you have the ability to create an icon and attach it to a file you have saved out from your C program.

Indent is a very nice program which formats your C source code so that it is easier to read. All the sloppy indents you did, all the white space you put in, is adjusted and neatened up. The program knows quite a lot about the syntax of C and it adjusts everything it meets to fit that picture.

The *Textra* text editor is supposed to be the best PD one around, and although I've not used it extensively I know this to be true just from the occasional play I've had with it. Although it is a very early version of *Textra*, it's still very usable and, as I always say, a text editor that works at all is better than not having one. (People normally throw me out of the bar when I start saying things like that, but that's by the by…) If your C compiler doesn't have a text editor built in, you could do a lot worse than use this toolkit and this editor to make your programs really zing along.

Value for money 9/10

QUANTUM AND TEMPEST

New Wave

Another utils disk, and a very good one too. It has a copy of *SID* on it, plus more eclectic stuff like *PowerPacker*, *BootAnyDrive*, *NewZap*, *DosHelp* and *MenuMaker*. But also, if you hit [Shift]-[F8] you get an Atari ST emulator. Nah, couldn't be. But it is. I hit the key, and sooner or later the prompt came up, along with that ghastly green screen and wasp icon. Urgh. Not so much an application of new technology as a misapplication… the very idea! I thought the Sinclair Spectrum emulator was a bad idea, but this just defies description. In fact, this emulator is only marginally slower than my real ST. (I do have one, but just for graphics interchange purposes, it never gets used, honest!) After the disk has finished running, ST programs can be loaded and run. Although the emulator did a good job of loading directories and stuff like that, it only ran a few programs, and these were small. I suspect it needs about 2Mb to run safely, and I only have 1Mb in my A500 do-it-all test machine.

But still, as an interesting curiosity it's a fun thing to tinker with (albeit of dubious legality as the German version of the Atari TOS must be living in the code somewhere), and who knows, there might actually be a use for it. Apart from embarrassing any Atari ST users you know with it, that is. Start up the program and at the appointed time you and a few carefully chosen friends all stand around and point at the poor ST owner, saying in unison, "If the ST is supposed to be a good computer, how come the Amiga can emulate an ST but not the other way round?" Then laugh loudly whilst rolling around on the floor.

Value for money 9/10

ALL SYSTEMS GO!

EdLib

This is a disk full of systems checking programs and although most of them are just source code, you will find almost every aspect of your Amiga system has a program to check or debug it here.

Value for money 7/10

BEST UTILS

EdLib

A collection of some of the best utility programs around. Covers general, CLI and disk utils, including *AZ*, *Clock DJ*, *PCopy*, *DiskSalv*, *FixDisk*, *InstallBeep*, *NoPalReset*, *SnoopDOS* and many more.

Clock DJ installs a menu bar clock which also gives you a listing of how much memory you're packing. *SnoopDOS* monitors all Amiga function calls, enabling you to track any bugs. *ChipCheck* does just that – it checks your Amiga custom chips to see which ones you have fitted. *NoPalReset* resets your machine if it boots up in NTSC mode, which happens from time to time, and gives you back the 56 lines of screen that you lose if this happens. An annoying bug, and one which is still hard to track. Once again the boffins among us will find this a great disk, but it lacks a certain gee-whiz value which some of the others have.

Value for money 6/10

FRED FISH 422

EdLib and others

Another fine Fred Fish disk, containing a fair ratio of duds to brilliant programs. *Gravity* is a program which simulates the movements of astronomical objects under the influence of gravity. For example, you can simulate the solar system in its entirety, or just two stars circling around each other. It's written by Guido Burkard.

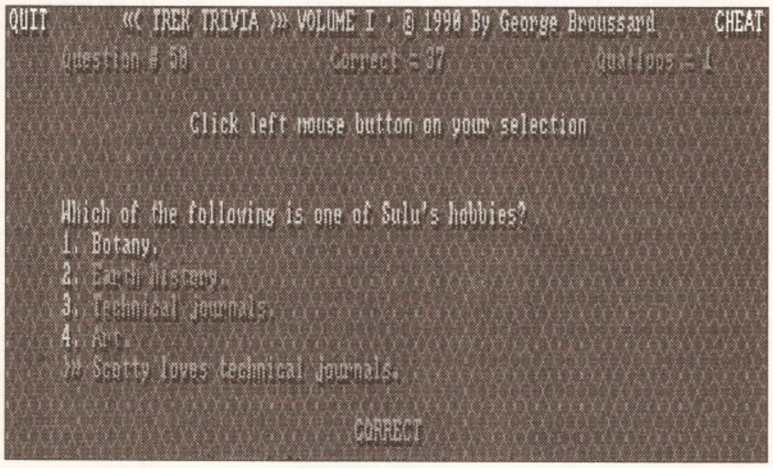
Imploder version 3.1 is a packer program written by Peter Struijk and Albert J. Brouwer, which allows you to reduce the size of executable files whilst letting them retain full functionality. It uses efficient algorithms as well as taking into full consideration the complexity of the Amiga environment. Very well done and easy to use. Don't get this version though, wait for the new version – 4.0 – which is supposedly much improved (although it's hard to see how it could be better than this).

PopUpMenu is a small program that makes it possible for you to use pop-up menus with any program that uses standard Intuition menus. Easy to install, and it makes many programs so very easy to use that it's almost criminal not to install this hack on your Workbench disk!

SystemTracer is tool to view and manipulate various AmigaDOS 1.2 and 1.3 system structures. Boring. And so is *TrackDOS*, a program that allows easy transfer of data between DOS, memory and trackdisk.devices.

TrekTrivia, however, is a very nice mouse-driven trivia program for *Star Trek* fans – ie, almost everyone over the age of 25. Contains 100 questions with additional trivia data disks available from the author. This is a new version which includes selectable skill levels, a cheat mode, and 250K of digitised music.

Value for money 9/10



Fred Fish 422 is the disk to buy for all you Trekkies out there.

FRED FISH 467

EdLib and others

Another fine fillet of Fish. Just two programs on this one, but what a pair they are. *Multiplot* is "an intuitive data plotting program featuring flexible input options, arbitrary text addition, automatic

continued on page 145

PAYING FOR IT

Be prepared to pay between 99p and about £2.50 per disk from a PD software house. Whether you pay the lower or higher price is entirely up to you. I suppose the variety in prices depends on how the disks are duplicated. If the company has an office and a duping machine, then it costs money to run. But if it's built the PD house into an existing business, then obviously it has no overheads to speak of. Some 99p PD houses are good, others are terrible. The only way to find out for sure is to spend 99p. Or read *Amiga Shopper* every month for the same price, and find out from us!

500 DISKS OF FREE PD

FOR ALL MEMBERS OF THE CHAMPION PD CLUB

How can FREE PD be undercut!

That's right, when you join our Amiga PD club you can receive PD software absolutely free. All you pay is 30p for the disk and a small charge for postage and packing, of around 20p. No minimum or maximum order. We have a good selection of demos, utility, music, business, games and animation, plus many more. When you become a member of the Champion PD Club you will receive a free catalogue on disk containing a complete library of our public domain software, updated free of charge. Membership for one year is just £19.95 payable to:

CHAMPION SERVICES, 31 SOMERSET CLOSE, CATTERICK, NORTH YORKSHIRE, DL9 3HE.

ELECTRICLOWN

☆ AT LAST A RANGE OF SELECTED PROGRAMS ON QUALITY MENU DRIVEN DISKS ☆

The Electric range of Disks has been specially compiled from the thousands of P.D. titles available. They are fully menu driven and topic related .... but don't just take our word for it, why not check them out?

ELECTRIC DISK Ref 01 — ANTI-VIRUS TOOLKIT
BOOTX
MASTERVK 2•1
VIRUS 4•01
ZEROVIRUS 111
VIRUS CHECK

ELECTRIC DISK Ref 05 — SPREADSHEET
CALCKEY
SCALC
SPREAD
VISCALC
VC

ELECTRIC DISK Ref 11 — DISK UTILITIES
FIXDISK
FORMAT
DISKSPEED
M.R. BACKUP
SHOWDISK
SID
ZAP

ELECTRIC DISK Ref 19 — PROGRAMMING UTILITIES
BI, ICON2C, CALLS, IMAGE EDITOR, CREF, INDENT, ERR, LIBCOUNTER, GETSPRITE, KEYCLICK

ELECTRIC DISK Ref 14 — HOME VIDEO
LOGTAPE, VPGEN, sMOVIE, VTOT, SPORTSTEXT, TITLEGEN

OUR FULLY MENU DRIVEN CATALOGUE DISK COMES COMPLETE WITH FULL DISK DESCRIPTIONS

ONLY **70P** Or FREE with your first order

ALL DISKS VIRUS FREE

FULL FRED FISH NOW UP TO 520
• T-BAG RANGES AVAILABLE •
PLUS MANY MANY MORE ....
SEE OUR CATALOGUE DISK

Many more Disks available, for full details see our Catalogue Disk

* QUALITY SELECTED P.D.
* QUALITY DISKS ~ Only the best *
QUALITY SERVICE ~ 1st Class Post *

ELECTRIC BUSINESS PACK
YOURS FOR ONLY £5.00 including P & P
• 02 WORDPROCESSING
• 04 DATABASE 1
• 05 SPREADSHEET

ELECTRIC DISKS £2. ea inc. P&P

ALL OTHER DISKS (FRED FISH / T-BAG etc) **95p** ea
Plus 50p P&P per order

ALL CHEQUES / PO's payable to ELECTRICLOWN

CONTACT: PAUL or MARIA
FEN HOUSE, 90 NOTLEY ROAD,
LOWESTOFT, SUFFOLK. NR33 0UG
Telephone **0502 ~ 566752** PROP: P. BLYTH

AMIGANUTS UNITED

169 DALE VALLEY ROAD, HOLLYBROOK, SOUTHAMPTON, SO1 6QX.
0703 785680 10.30 to 5.30. Fax only.

BUG-BASH: Kill the bugs, clean up the trash in the garden. A good fun game. £3.00
1036: AMIBASE PROFESSIONAL II. (V1.2) The new additions to this database make it a must have, it includes a nice picture addition facility (1Meg) £3.50
877: 1 ACROSS 2 DOWN. A fully fledged crossword program, for only £5.00 (Data disk no. 1 supplied free). Data disks 2, 3, 4, & 5 now ready at £2.00 each.
1038: SUPER AMIDASH. Do you remember that good old Commodore 64 game Boulderdash? Well here is your chance to have that fun again. 1Mb £3.00
1068: MOD PROCESSOR V1.92. Make picture and/or music progs, adjust pic height/width. This version will load the new 8 Channel Octamed music and is excellent! £3.50
1161: INTUIMENU V3. The easiest way yet to execute all your programs. By Nicholas Lewis ..£4.00
1100: SCHOOL TIMETABLE CREATOR. (Print your timetable). By Keith Grant. 1Mb £3.00
1102: THE SPRITE DESIGNER. A good way to draw/ save sprites. By Frank Tout. £3.00

Into coding? - Want to learn? The Amiga Coders Club is for you! ACC 1-4 is the first four compressed issues of an excellent series for coders, even if you are new to the Amiga. If you want to learn Assembly, using DevPac, (or our own new ACC special assembler disk), this is the club for you! ACC 1-4 (compressed) £1.50. The Amiga Coders Club disks are packed with source, hints, tips, advice from many of the well known coders that are on the Amiga scene today. Issue numbers 5-17 are now available. Please note, (excluding the compressed introductory disk (ACC 1-4), and no. 12) the price for each issue of the ACC disks is only £3.00. ACC 12 is our birthday issue, it is a 2 disk set, and therefore the price is £6.00. Amiga Coders Club Special! Here is a low priced assembler package for all you coders out there in Amigaland. (See the review in the Amiga magazines) £5.00

MASTER VIRUS KILLER V2.2 IS HERE!
It now recognises another 27 of the little buggers, including the virulent Sha! and the destructive Disk-Validator virus. only **£5.00**

It's here at last! The complete two disk version of Mike Simpson's **A-GENE**
Europe **£15.00**, rest of the world **£20.00.**
Get this Geneology program now!

THE NEW (1MB) EIGHT CHANNEL MIDI COMPATIBLE OctaMED V2 IS HERE!!!

It now contains full notation, including a notation editor with notation printing 5-7 channel modes for high quality, non-CPU stressing audio/split channels, sixteen track display for Midi use and a host of other new *MED* features. V3.20 of the Public Domain four channel med is also encoded into this excellent program and you can switch from 8 to 4 channels at will. Price is £20.00 for all European countries (£25.00 for non-European), includes VAT but not postage. Payment in pounds Sterling only. If ordering overseas, send a bankers order/Eurocheque etc (Credit card orders will not be accepted). Important notice to all registered purchasers of OctaMED V1. If you return your original Amiganuts disk, containing V1, you can have V2 for half price (ie. £10.00 Europe). REMEMBER, you must return your original V1 copy.

FREE PRIZE DRAW * ALL PURCHASERS of OctaMED V2 WILL BE ENTERED * FREE PRIZE DRAW
1st PRIZE: Golden Image Scanner.
2nd: LCD Colour TV.
3rd: £50 of progs

SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE SUBSCRIBE

If you would like to obtain the Amiga Coders Club disks as soon as they are published, why not send £33.00 and ask to go on the ACC mailing list now? We will send you each issue as soon as it's ready, (applies to issue 14 onwards). If ordering from outside EC Countries, add and extra £6.00 for years postage

PLEASE NOTE THAT ISSUES RELEASED PRIOR TO ACC 14 MUST BE PURCHASED SEPARATELY (DUE TO V.A.T. ACC PRICE INCREASE IS UNAVOIDABLE IN 1992 SO SUBSCRIBE NOW!!)

If you would like to take out a years subscription for the T.BAG disks, (applies to issue 50 onward), simply send £33.00 and we will send you each issue well in advance of them becoming available from any other supplier. (Note that issues 50 to 56 are ready now and will be sent upon joining). Issues released prior to T.BAG 50 must be purchased separately @ £2.00 each. If ordering from a non EC country, add extra £6.00 to cover the years postage.

Note that excluding the T.Bag Disks, none of the above programs is Public Domain. **Postage:** EC Countries, (inc UK), ADD 50p, non EC £1.00, rest of the world £2.00.
THE FINAL 1991 CATALOGUE UPDATE IS READY, SEND FOR YOUR COPY NOW! ONLY £1.00.

SLACK WILLYS

MAXIMUM PD

MAXIMUM PD
1168 London Road
Derby
DE2 9QG

DO NOT PAY OVER 99p FOR PD. ANY MORE IS A *RIP OFF!*

99p per disk

ORDER BY CREDIT CARD NOW

SERIOUS SOFTWARE

261 PC Emulator
124 No Click
091 Wordwright
098 M Cad
099 Analyticalc
090 BankN
120 DCat Disk Cat
053 C Manual (4 Disk set)
139 North C
145 A68k Assembler
118 Spectrum Emulator
117 ST Emulator
116 C64 Emulator
198 Typing Tutor
115 Workbench II
092 Home Management
094 Home Banking
128 X Copy 3
122 Master Virus Killer

GAMES SOFTWARE

197 Fruit Machine Sim
072 Best Arcade Games
073 Best Board Games
056 Games Galore Vol 1
057 Games Galore Vol 2
058 Games Galore Vol 3
059 Games Galore Vol 4
060 Games Galore Vol 5
061 Games GAlore Vol 6
101 Treasure Island
103 Pair It
104 Face Maker
105 Talking Book
027 Missile Command
256 Drip
075 Snakepit
074 Pongo
068 2 Player Soccer League
219 Ballonacy

ADVENTURE SOFTWARE

164 Larn
165 Empire
166 Imperium
167 Bull Run
168 Golden Fleece
169 Holy Grail

SOFTWARE FOR PRE SCHOOL AGE

105 Colouring Book
104 Face Maker
106 Learn & Play (2 disks)
103 Pair It
029 Train Set
101 Treasure Island

PUZZLE SOFTWARE

107 Crossword Creator
108 Quizmaster
111 Turn & Tricky
112 Puzzle Pro
113 Word Square Solver

Music Software

134 Soundtracker Pro
136 Perfect Sound Sampler
137 Classical Music
123 Future Composer
052 Octaliser
135 16 sound sample disks (each)

MAXIMUM PD DISK SETS

001 Business Set £4.95
005 Games Pack 1 £4.95
006 Games Pack 2 £4.95
044 Games Pack 3 £4.95
045 Games Pack 4 £4.95
019 Card & Board £3.96
004 Programming £4.94
028 Education £4.95
024 Youngsters £1.98
020 Beginners £3.96
046 Introduction £9.00
022 Video £2.97
014 Musician £4.95
007 Demos £4.95
018 Graphics £4.95

Adult Sets

MAX ADULT SET 1 £4.95
MAX ADULT SET 2 £4.95

Our Adult Sets contain material suitable for over 18 only.

SLACK WILLYS MAXIMUM PD

SLACK WILLYS NEW DISKS

New Games

377 Darkstaff
378 Seven Tiles
379 Gridrunner
380 Air Ace
381 Llamatron
382 Trix
383 Amigoids
384 Battle Pong
385 Blue House
386 Zeus
387 Scum Haters

New Utilities

391 Beginner Bench
390 Multiripper
621 Master Virus Killer V2.2 (do not pay £5.00 for this product. Dont get ripped off!)

New Demos

399 Mr Potato Head
400 Evolution Slide Show
401 Sargent Pepper

MAXIMUM

0332 758683

PHONE FOR CATALOGUE. MANY MORE TITLES STOCKED

All our Public Domain is priced at £0.99p per disk. Postage and packing costs only £0.60p. Please note that some titles contain more than one disk. Please make all cheques payable to "Maximum PD". All our prices are inclusive of VAT.

A.J.P.D.L.

17 WATSON AVENUE,
ST ALBANS,
HERTS
AL3 5HP
DEP ASH

80p PER DISK INCLUDING P&P

Make Cheques and Postal Orders payable to A.J.P.D.L. and send them to:
17 WATSON AVENUE,
ST ALBANS, HERTS
AL3 5HP

DEMOS

D001 Classic Demos
D002 Stealthy 2
D003 Fleet Manoeuvres
D004 Iraq Demo
D005 Naughty Slideshow d1
D006 Naughty Slideshow d2
D007 Safe Sex
D008 Iron Maiden
D009 Lotus Car Chase
D010 Robocop 2 Slideshow
D011 Naughty Cartoons
D012 Robocop 15 seconds
D013 Total Recall
D014 Evil Dead
D015 Alternative Neighbours (X)

GAMES

G001 Missile Command
G002 Pontoon
G003 Risk
G004 Star Trek d1
G005 Star Trek d2
G006 3d Tetris
G007 Tetris
G008 PakMan 81
G009 Monopoly
G010 Games Galore
G011 Chess
G012 Games Disk
G013 Flaschbler
G014 Video Tennis
G015 Holy Grail

MUSIC

M001 Debbie Gibson - Electric Youth d1
M002 Debbie Gibson - Electric Youth d2
M003 Madonna - Spanky
M004 Petshop Boys - Aways On My Mind
M005 Jean M Jarre - Docklands
M006 Music Invasion 2
M007 Betty Boo d1
M008 Betty Boo d2
M009 Madonna - Vogue
M010 Batdance Megamix
M011 Madonna - Like a Virgin
M012 Eve Of The War
M013 Yellow Megamix
M014 Queen - Flash d1
M015 Queen - Flash d2
M016 Loadsamoney Rap
M017 Pet Shop Boys
M018 Jean M Jarre - Live
M019 Genesis
M020 Sam Fox (X)
M021 Queen and Black Box
M022 Dire Straits
M023 Bomb The Base

UTILITIES

U001 Master Virus Killer
U002 Mega Utility Disk
U003 Amibase
U004 Qbase
U005 Spreadsheet
U006 Journal
U007 Text Plus
U008 CLI Tutor
U009 ZX Spectrum Emulator
U010 Commodore 64 Emulator
U011 Dark Star
U012 Game Music Creator
U013 Sun Dragon Utils
U014 D Copy
U015 Zodiac Compactors
U016 Digi Tech Utils
U017 Wiz Base
U018 C-Light
U019 Jazz Bench
U020 Noise Tracker
U021 Biorhythms
U022 North Sea 1.3
U023 M-Cad

Free Catalogue with every order.

No Minimum Order. **VIRUS FREE**

Orders despatched within 24 hours or receipt of order.

If you cannot see the disk you are looking for, send us details and we will get it for you for no extra charge.

continued from page 142

scaling, zoom and slide with clipping at boundaries, a range of output file formats and publication-quality printed output." Preferences printers are supported via transparent use of the PLT: device. This new version includes many bug fixes, new features, plus Adobe PostScript and Hewlett-Packard LaserJet support. Thanks are due to Alan Baxter, Tim Mooney, Rich Champeaux and Jim Miller for this very interesting program.

As well as all that, if it wasn't enough, the other program on the disk is *PowerSnap. PowerSnap* is a very clever clipboard-type utility, written by Nico Francois, that allows you to use the mouse pointer to mark characters anywhere on the screen, and then paste them somewhere else. You can paste into another CLI, or even into a string gadget in another program. The program checks which font is used in the window you snap from, and will look for the position of the characters automatically. It recognises all non-proportional fonts of up to 24 pixels wide and of any height. As a bonus it works with AmigaDOS 2.0 in both shell and Workbench environments.

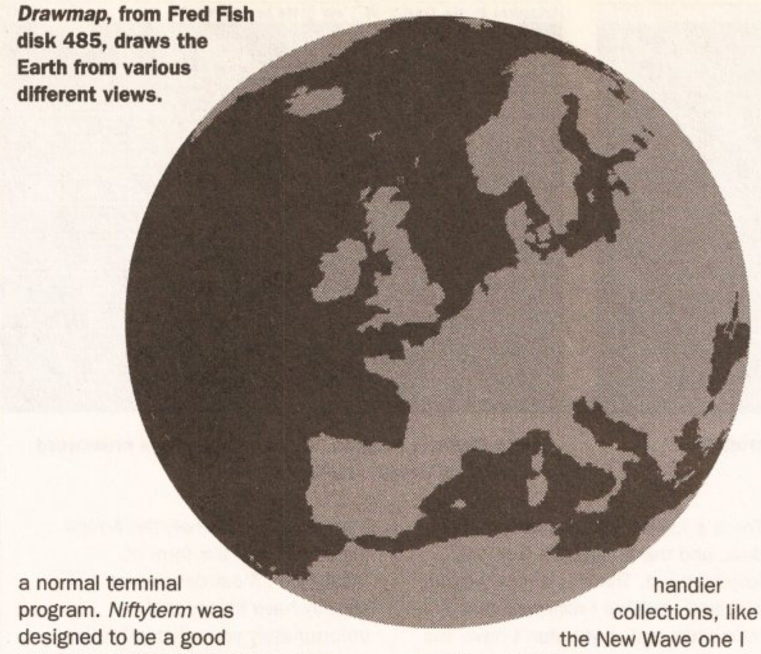
Value for money 9/10

FRED FISH 485

Softville

More Fish for your fishnet. *Drawmap* is an excellent program for drawing representations of the Earth's surface. This version includes a completely rewritten user interface and some new functions. It is an update to version 2.0 on disk 315, and includes the source code by Bryan Brown and Ulrich Denker.

NiftyTerm is an H19/VT102/VT52 emulator for the Amiga. It was originally designed to be used with the DNet system, but it has been expanded so that it may be used as a normal terminal program. *Niftyterm* was designed to be a good emulation of the above terminals, as well as being fairly small and fast. This is version 1.2, an update to version 1.0 on Fish Disk 403. A very useful addition to your machine if you're long on comms but short on disk space.



***Drawmap*, from Fred Fish disk 485, draws the Earth from various different views.**

Spades, on the other hand, is a very slow and tortuous game. It looks like it was written in Basic, and is an Amiga version of the 'spades' card game. It's a one player version where the computer plays your partner and two opponents at once. Foolish and very slow.

Value for money 5/10

SLICK UTILS

17 Bit 1274

A collection of utils, a bit routine but very comprehensive and menu-driven for ease of use. Features the usual text engines and powerpacker, but also has some disk organisers, icon editors, disk and file repair programs, a virus killer and an archive util called *LHArcA*. The collection is handy, but I can think of handier collections, like the New Wave one I mentioned before.

Value for money 6/10

UTILS

17 Bit 1280

17 Bit's own utils disk, with a collection of really out-of-the-way techie utils. *TimeRAM* is a sort of benchmark for checking the speed of the Chip and Fast RAM in your computer. How is this possible? Well, that's what I asked. Benchmarks are of dubious use in my book: how can you test the performance of a computer on the computer you are testing? Surely the test programs run at the speed of the computer, and so can easily downrate themselves? The only true test is to use another computer to test the speed, thereby providing a sort of control, in the scientific sense.

ANSIPT20 is actually *ANSIPAINT*, which enables you to create those weird ANSI graphics on a normal Amiga screen. This is handy if you have a ANSI-based BBS, but otherwise of absolutely zero use to anyone else.

SysInfo is a program which shows you the state of your system, and things like its relative performance to a 68030 or IBM XT. It also senses which chips you have fitted, how much memory you have and which system you're running. This is is less of a program than version 2.0, which I saw recently, but it's good fun nonetheless.

ARTM is a similar sort of system monitor, but a little more interactive. The initials stand for *Amiga Real Time Monitor*, and it allows you to examine the various system activities that are going on under the surface, and if necessary to remove them. This is a valuable debugging tool, as it allows you access (using the mouse) to the all of the Amiga's important little places. The *Xoper* program is a similar affair, but it doesn't feature the same level of interaction and, for completeness more than anything else I should think, this is on the disk too.

VirusX v5.0 is a new virus killer from Steve Tibbett, although looking at it, it doesn't seem to be much different to v4.0.

Finally, by way of little light relief there's a copy of *Jive*, a text filter that takes a sentence and converts it into the sort of American jive talk popularised by 1970s black exploitation films, and indeed *Starsky and Hutch*. So the question "How are you?" comes back as "How you is?" and "Very good indeed" comes back as "very baaaad indeed". Interesting toy, but I wouldn't recommend its use as an English/Jive dictionary!

Value for money 7/10

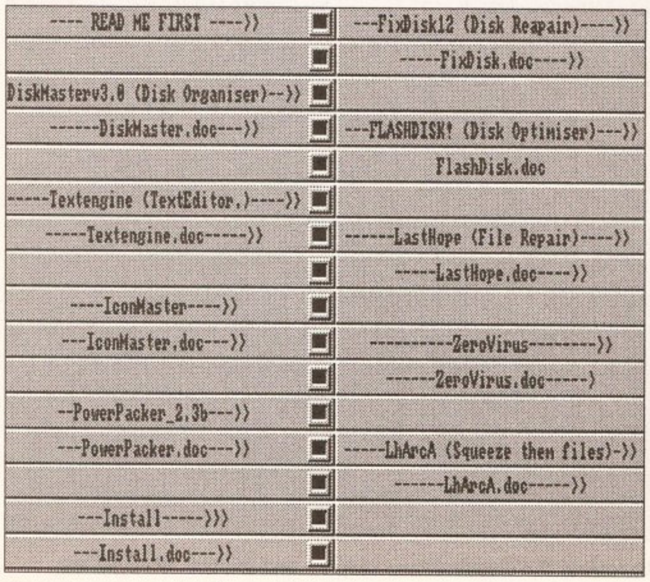
OPTICOMMS 1

17 Bit 1275

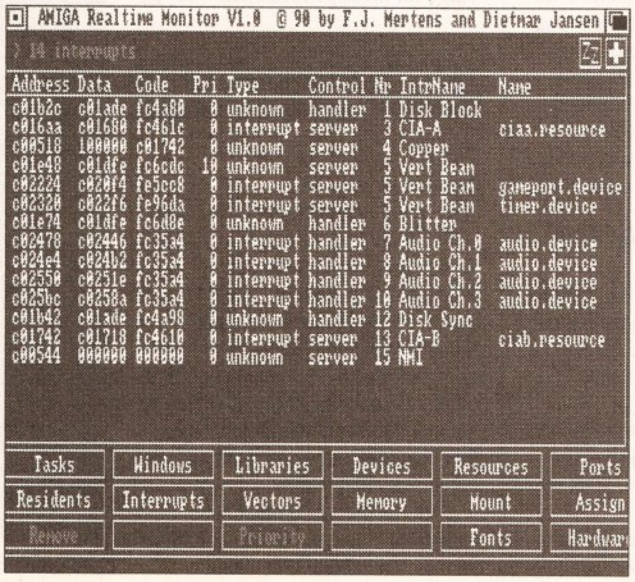
This is a comms utilities disk, containing the popular *NComm* terminal emulation and comms program, plus versions of packing utilities like *LHArc, PKAZip, Zoo, Arc, LHWarp, LHFix*, and *PPRefs*, plus all the documentation for the programs. This is a good-value starter disk for anyone who's just bought, or who is about to buy, a new modem, and needs a collection of basic comms utilities. The only thing it doesn't have is the *Supertex 2* program for using viewdata-type BBSs (like Micronet), which you need to download things from such boards.

Value for money 8/10

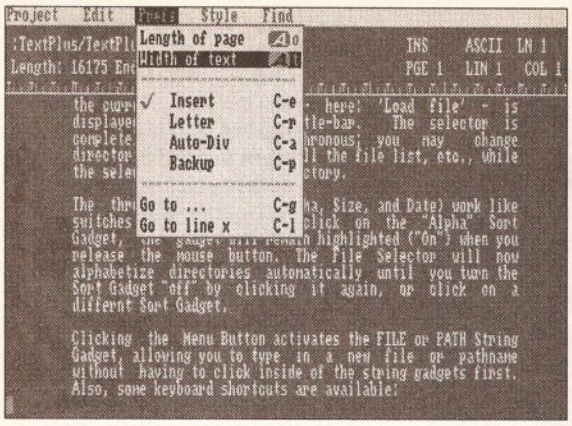
continued on page 146



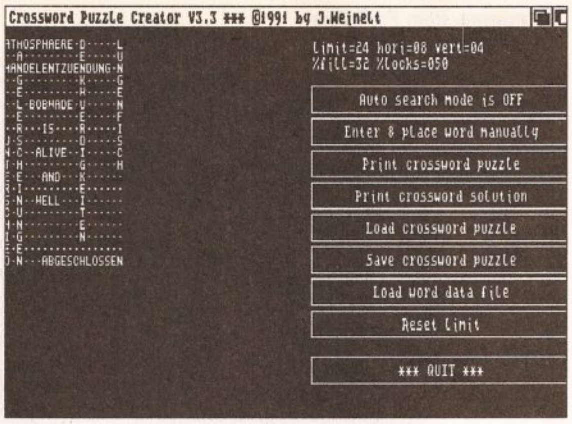
Slick Utils comes with a rather neat front-end for ease of use.



***ARTM*, on 17 Bit disk 1280, is a total system monitor.**



***TextPlus* is a well-respected text editing program, available on 17 Bit disk 1065...**



...as is *Cross*, a program which will create a crossword from a list of words supplied by the user.

continued from page 145

BITS AND BOBS

17 Bit 1064

I call this disk bits and bobs, because that's what it is, rather than what it is actually called in the library. It's just simply 17 Bit disk 1064, although Errol Wallingford is the person who actually compiled the disk. Errol comes from Ontario, and he liked this disk so much he decided to spread it around.

This disk of bits has *Triangle*, *Uedit*, *TripleYachtZ*, *Family Sol* and an odd program called *TDP*. What *TDP* does is a little unclear at first, as it puts a little window in the menu bar with things like:

```
df0: 35 df1: 41
```

This could be the blocks used, memory used or memory free on these disks. As there is no explanation on the disk, I checked the disks using the info command to see what the numbers might apply to. It turns out that the program is a track display program (hence *TDP*), letting you know which track the disks in your disk drives are on. That'll save you the money you would have spent on one of those fancy drives which tells you the same info!

Family Sol, *Chinese Triangle* and *TripleYachtZ* are just a trio of very obvious games. But *Uedit* is a very useful text editor for programmers, and one which I recall having something of a following in the USA.

Value for money 7/10

GERMAN COMPILATION

17 Bit 1065

A similar disk to the Errol Wallingford disk, only this time all the programs are from German sources. On this disk you have two games called *S-Ball* and *Tron* (a version of the Light Cycle game from the Disney film of the same name), plus two more serious utilities in the form of *Cross* and *TextPlus*.

TextPlus is another well thought-of text editor; and this is version 2.2E, written by Martin Steppler. There's full documentation on the disk, and the program is fast and fully-featured. There is a new version out, and I believe I reviewed this a little while ago. If you don't have this program then go and get it, because it's really pretty good.

Meanwhile the *Cross* program is a crossword creator. You feed it the words, and it creates a crossword for someone to solve. It does have some automatic flowing facilities, where it takes a text file of your words and fits them all together, but you can add words and edit them manually if you wish.

Value for money 5/10

DIP BROTHERS UTILS

17 Bit 1279

This is a nice collection, although it contains a lot of predictable stuff. It does have the *Hatrick* 60Hz simulator, which allows you to use NTSC programs on a PAL Amiga, and as well as *Power Packer*, *Amiga Real Time Monitor*, Psuedo Ops *VK*, and a version of *Space Invaders* (*Whaaat? – Ed*) it also has *Utility Boot Installer* and *Intuitracker*, an Intuition *Soundtracker MOD* player. A nice varied utilities disk, which is better than most.

Value for money 8/10

APPLICATIONS

DICE

Electriclown UL-09

This is a C compiler written by Matt Dillon, including an entire working environment for writing and debugging C programs, and finally compiling them into super-fast machine code for you to run like any normal Amiga programs. Although not as accessible to the beginner as *NorthC*, for the technically minded this program – once properly set up – can cover most bases.

This is the unregistered shareware version of *DICE*, obtained usually from the public bulletin boards and PD libraries. It is missing one vital item, namely the Amiga Include files in the form of 'amiga.lib'. Most developers will already have these, and unfortunately you will need to get them from somewhere. The registered version of the program contains everything you need, and of course pays the license fee to Commodore for using their libs.

I don't know if you can obtain them from Commodore as part of a Native Developers Kit or something, but you can try. Not having the includes limits what you can do with *DICE*, although the version on this disk does have some files called *amigas13.lib* and *amigas20.lib* which will help a little.

Value for money 7/10

CROSSDOS DEMO

17 Bit 1266

This is a demo version of the famous *CrossDos* program. *CrossDOS* is a software product that allows the Amiga user to read and write MS-DOS and Atari ST format disks directly from AmigaDOS using the normal Amiga drives. It fully integrates itself into the Amiga operating system too, allowing your MS-DOS formatted disks to be accessed from virtually any utility or application where you can hit a button or type a pathname. The MS-DOS disks are invisible to the system, meaning that they can then be used like any other Amiga disk, as long as you use the right drive prefix. If you name your drives pc1: and pc0: instead of whatever they come named as, you type pc1: to make the external drive read an MS-DOS disk, or df1: when you want it to be Amiga.

This allows you to access any MS-DOS file just as you would any other Amiga file. The release on this demo disk is a 'read only' version of the *CrossDos* program. It's a fully-functional version of the product, but with the writing functions disabled. If any writes are attempted to the MS-DOS device or disk, you'll get a "Write Protected" requestor, no matter what you do.

This is a nice way to try a product like this and enjoy it before you buy. You might try the program *MessyDOS* if you like it, as this is a fully-functioning PD program of the same sort.

Value for money 8/10

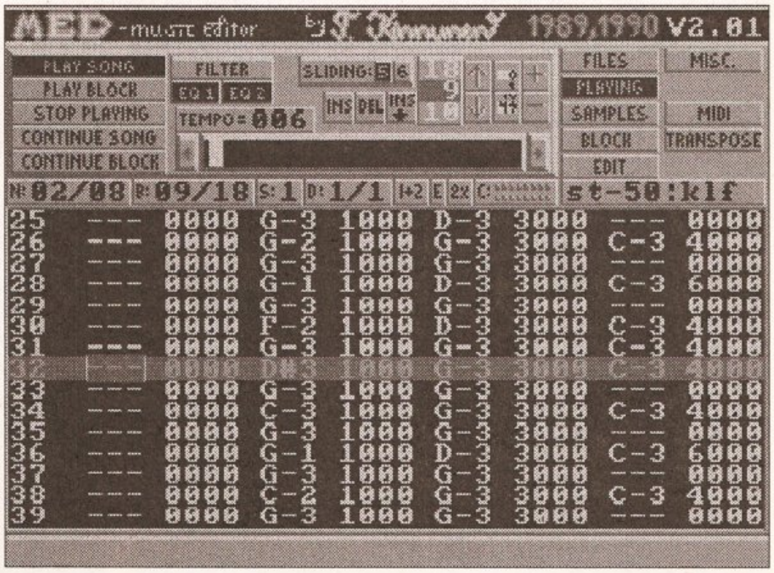
MUSIC

MED MODS 1 AND 2

17 Bit 1264 and 1265

A bunch of tunes made using the *MED* music program, for playing or use in your own programs. Lots of good samples to modify and steal too, so for musical Amiga types this is a very good buy, especially if you haven't got a copy of *MED* yet, as a copy of version 2.01 is also included with the disks to play the tunes. I would recommend getting the latest version of *MED*, though, and using

continued on page 148



***MED* is fast becoming the standard tune player – and it's free. MED MODS disks 1 and 2 contain version 2.01 of the program as well as sample tunes.**

HyperQuick

28 Forrest Rd., Penarth, South Glam. CF6 2DP

GAMES

4 Strategy Games - *4 Sim games*
5 Truckin On (2) *
10 Castle of Doom - *Graphic Adventure*
15 Star Trek (3)* - *Two Drives reqd.*
21 Holy Grail Adv.* - *Good Text Adv.*
23 Breakout Con. Set
32 Murder - Playable Demo
33 Back to the Future III - *Demo*
35 Snakepit - *Addictive*
37 Return to Earth - *Like Elite*
45 Star Trek - The Final Frontier (2)
50 Frantic Freddie - *Platform Game*
52 Master of the Town - *Be a Vandal!*
55 DarkStaff - *Old Speccy 128 game*
56 Scumhaters - *Good Shoot 'em up*
L1 Footie - *Licenceware £3.00*

DEMOS

607 System Violation Demo *
608 Fractal Flight Demo
615 Armageddon Demo *
616 Purple - *Huge Vectors*
620 Red Sector Cebit Demo
621 Pussy Innership
630 Ecstasy Demos *
631 Teenage Turtles Demo
632 Mr. Food (2)
633 RAF Megademo (2)
634 Chromium
635 Materialised
637 Coma Demo
638 Total Confusion *
640 Red Sector Megademo (2)
644 Silents: Blue House (2) *
645 Simpsons Demo - Decay *
646 Drifters Demo - 6 of 1 - Prisoner

ANIMATIONS

650 Iraq Demo - *Well done and funny*
655 Puggs in Space
656 The Coyote Strikes Back *
657 Tron Animation (2) *
658 Franklin The Fly
659 Mars Demo
660 Juggette Anim & Juggette II*
661 Juggler Demo II - *All time classic*
663 Fillet the Fish - *Very Funny*
665 Steve's Anim Disks (5) - *Lots &.................*
670 Batman* - *Excellent*
671 Revenge Horror Show - *Sick*
675 The Education of Cool Cougar *

Fred Fish 300-520
TBag Disks 1-55

UTILITIES

102 DCopy - *Tis what we use*
110 Ncomm V1.9 - *All you need for a modem*
120 DPaint Fonts (4)
129 Hamlab - *Picture Convertor*
135 Picture Format Convertors
141 C-Light - *Ray Tracing*
150 Red Sector Demo Maker V1
156 Intromaker
159 Superworkbench V1.5
162 Sid V1.06
190 NorthC V1.3 (2) - *C Compiler*
192 C Tutorials (4) - *Learn C*
201 NoisePlayer V3
204 Soundtracker V4 (2)
207 Future Composer
208 Star Trekker Music Prog. V1.2
210 MED V.3 - *Brilliant Music Creator*
211 Sound Applications (2)
225 UEdit V2.6 - *Excellent Screen Editor*
229 Spread - *Good Spreadsheet*
230 Textplus V3.0 - *V. Good Wordprocessor*
239 Flexibase V2 - *DataBase prog*
240 Spectrum Emulator V1.2
251 PowerPacker V2.3 - *Program Cruncher*
301 A-Gene V3.12* - *Family Tree tracer*
302 Golf Recorder V1.6* - *Stats Analyser*
303 Anti-Virus Tool Kit

MUSIC

403 Madonna: Hanky Panky
404 Queen - A Kind of Magic
411 Crusaders - Bacteria
415 Bomb the Bass
418 Depeche Mode
421 Flash - Queen (2)
422 Vangelis *
430 Beatmasters: Technology
438 Cave Synthetic Power
439 Crusaders: Sheet Music
441 Taipan Music Demo (2)
446 In A Silent Way
451 Art of MED
452 Seal: Crazy Remix *
453 The Reincarnation of Sgt Pepper (2) *
454 Vivaldi: The Four Seasons (2)

SLIDESHOWS

709 Viz Slideshow
713 Golem's Gate Slideshow
714 Nemesis: Prologue
717 Countach Fantasy Slideshow #1
718 Countach Fantasy Slideshow #2
719 Kylie Minogue (2)
721 Madonna Slideshow II (2) *

Key

* denotes 1 meg reqd.
(x) Figure in brackets denotes the No. of disks in set.

Charges

1 Disk	£1.50
2+ Disks	each £1.00
Cat. Disk	£0.50
UK Postage	FREE
Europe Postage	£1.50
World Postage	£2.50

Please make payments payable to HyperQuick

SPEEDY PD

Please make cheques/postal orders payable to:

Speedy PD (Dept. AS),
13, Market Street,
Bracknell,
Berkshire, RG12 1JG.

Tel: 0344 412347

Top 10 Demos

Phenomena Enigma
Silents Global Trash
Darkness Megademo II
System Violation
Phenomena Interspace
Crionics Neverwhere
USA Vs Iraq
Crusaders Genesis
Budbrain II
Harlequin Demo

Top 10 Games

Megaball
7 Tiles
Drip
Gridrunner
Zeus
Shapes
Sealance
Twintris
Battle Pong
Atic Atac

Top 10 Utilities

Master V killer 2.1
R.S.I. Demomaker
D-Copy
Label Designer
Iconmania
Ham Lab
SID V1.06
Assassins Bootblocks
C-Light
Cross Dos

Top 10 Music

MED V3.00
Game Music Creator
GMC Instruments
Oktalyser
MED Modules
Music Utilities
Soundtracker v2.5
Noisetracker
Soundtracker Samples
Sound Workshop

£1.25 each + 50p P&P

Order 10 or More and get a FREE DISK BOX

24 Hour Hotline on credit card orders:

0344 412347

Access VISA

Top 10 Business

RIM Database
U-Edit W/P
QED
Visicalc
Flexibase
Bank N
Amibase 3.76
Secretary V1
Quickbase
W/P Utilities

Send for our current Catalogue disk featuring over 2000 titles. Atari ST and IBM Public Domain/Shareware also available. Massive discounts on commercial software and hardware, a printed catalogue is available on request. Please send 75p to receive any of the catalogues.

ALL DISKS STILL ONLY 99p EACH

anglia PD

NEW! - ANGLIA "PLUS" PACKS. The ultimate in PD software giving you the convenience of a commercial package at a PD price. Each "PLUS" pack includes the highest quality PD programs together with full printed instructions presented in an impressive folder. The first "PLUS" pack to be released is The Business "PLUS" Pack which contains 5 disks covering a complete range of business software and over thirty pages of instructions.
The complete package costs just £7.95...More "PLUS" packs to be released soon, phone for details.

BUSINESS PACK 5 DISKS £4.95
Text-Plus v2.2E (Word pro), 4 databases including RIM, Clerk (accounts), Spreadsheet, MCAD (graphics), + 2 Spellcheckers.

DESKTOP VIDEO PACK 4 DISKS £3.96
Outstanding collection for video producers, includes Rolling Credits, Slideshow, Video Backgrounds, Special Effects, Pattern Generator and more!!!

PROGRAMMERS PACK 5 DISKS £4.95
Forth, Modula 2, Lisp, Logo, Pascal, North C v1.3 + C Manual disk.

NEW! HOME MANAGEMENT PACK 3 DISKS £2.97
Calender, Mortgage, Spreadsheet, Grammar, Mileage, World Time, Budget, Chequebook, Database, Typing Tutor, Typewriter, Grocery, List Maker, Home Banking.

BEGINNERS PACK 4 DISKS £3.96
CLI Tutorial, Quick Copy, E.S.A. Utilities, Disk Master v3.0.

CLIPART PACKS 1, 2 + 3 5 DISKS £4.95
3 different packs of 5 disks, all full of the very best clipart for DPaint etc.

FONTS PACK 1, 2 + 3 5 DISKS £4.95
3 different packs of 5 disks, pack 1 contains: Publisher fonts, various fonts, fonts disk 2, Cosmopolitan fonts, large fonts (loads of great fonts for DPaint etc.)

NEW! ANGLIA COLOURFONTS 5 DISKS £4.95
Contains 5 disks full of original colourfonts produced here at Anglia, ideal for captions, titles, etc. Use with DPaint III.

ADVENTURE PACKS 1 + 2 5 DISKS £4.95
Pack 1: Holy Grail, Golden Fleece, Castle of Doom, Return to Earth, World, Colossal, Adventure Writer. Pack 2: Dragon Cave, Moria, Rings of Zon, Imperium Romanum, Larn v1.2.

CARD & BOARD GAMES 4 DISKS £3.96
Cluedo, Cribbage, Monopoly (English version!), Mastermind and much more!

ULTRA GAMES PACK 5 DISKS £4.95
Seven Tiles, Balloonacy, Mayhem, Battleforce, Arcadia. (All of these games have received rave reviews from Amiga magazines).

NEW! GAMES GALORE PACK 5 DISKS £4.95
Over 30 Games on 5 disks! Includes great games such as Sky Fight, Dad, Trek Trivia, Five-in-Line, Diplomacy, Chess, Monopoly, Othello, Space Age, Air Traffic Control, and loads more!

UTILITIES PACKS 1, 2, 3 + 4 5 DISKS £4.95
4 different packs with all the utils you will ever need! Pack 1 contains: Chet Solace disk (26 utils), Diskmaster v3.0, Darkstar Utilities 2, 3 & 4.

ADULTS PACK 1 5 DISKS £4.95
5 disks full of "animations". 18 and over only.

ADULTS PACK 2, 3 + 4 5 DISKS £4.95
3 different packs of five disks full of "slideshows". 18 and over only.

EDUCATION PACK 1 5 DISKS £4.95
German, Globe, Geotime, Drawmap, Evolution, Clouds, Formula, Airfoil, Gravity Sim, Weather, Wave Maker, World Data Bank and more!! (This pack is one of our best sellers and is incredible value for money).

Please note: all pack disks may be bought singly at 99p!

SINGLE DISKS AT ONLY 99p!

BUSINESS
B301 Bankn (Home Accounts)
B303 Flexibase (Database)
B304 Wordwright (Word processor)
B305 Visicalc (Spreadsheet)
B306 U-Edit (Great word processor)
B307 Journal (Good home accounts)
B322 600 Business Letters (All ready to go)
B323 Database Master V2

UTILITIES
U401 Power Packer 2.3B (Superb Cruncher)
U402 Master Virus Killer v2.1 (A must)
U458 Freud (Take the test!)
U404 A-Gene v3.125 (Latest Family Tree)
U405 ST + C64 Emulators + MessyDOS
U406 Jazzbench (upgraded Workbench)
U407 WB2 (Workbench v2.0 lookalike)
U471 X Copy III (The ultimate copier)
U413 Sid v1.6 (makes you a master of CLI)
U438 Spectrum Emulator (9/10 Amiga Shopper)
U465 Antiflicker (eases high-res flicker)
U476 Golf Performance (Record golf stats)
U472 Comms disk (total modem control)
U461 Cryptic utils (inc. Diskmaster)

GAMES
G620 Pipeline (commercial quality)
G659 Turn + Tricky
G632 Tennis
G602 Megaball (The best breakout game)
G673 Trucken (Run your own company - 2 disks)
G672 Air Warrior (Good flight sim)
G607 T. Richter Star Trek (2 disks)
G641 Star Trek (3 disks)
G624 Blizzard (Superb shoot-em-up)
G671 Mental Images (9/10 3 great games)
G651 Eat Mine
G652 Dynamite Dick
G670 Zeus (Very addictive)
G663 Sealance (great sub simulator)
G662 Boing the Game (2)
G655 Crossword Creator
G660 Wordsquare Solver
G668 Fruit Machine
G674 Wizzys' Quest

CHILDRENS
C701 Learn + Play (2 disks)
C702 Train Set
C703 Talking Colouring Book
C704 Simon Says/Space Maths
C705 Treasure Island
C706 Snakes + Ladders
C707 Pair It (Play it with the kids!)
C708 Cross Fire (Fun & addictive)
C709 Pixie Kingdom (2 disks)
C711 Wacko in Wonderland (Like Dizzy!)

GRAPHICS
GR801 C-Light (Ray trace)
GR802 DKB Trace (Ray trace)
GR803 Slide Show Construction Kit
GR819 Amos Paint (v. good paint prog.)
GR805 Mandelbrot Generator v1.85
GR821 Spectrapaint (serious DPaint rival)
GR807 Graphics Utilities Disk
GR828 Hamlab (Great Picture Processor)

MUSIC
M901 Med v3.0
M902 Sound Tracker Pro
M903 14 Sample disks for above
M919 Kefrens Jukebox
M920 Future Composer

PUBLIC DOMAIN SOFTWARE

ANGLIA PUBLIC DOMAIN LIBRARY
Anglia House, 115 Ranelagh Road, Felixstowe, Suffolk, IP11 7HU

TELEPHONE 0394 283 494

Access VISA Creditcharge CREDIT CARD ORDERS

Simply phone your order through or send a cheque/postal order. Please add 60p to cover post and packing.

continued from page 146

the *MED Player* program rather than having to boot *MED* and the tunes up each time you want to play them. The disk contains some very professionally-made tunes, although I've seen some of them before as the demo tunes on certain music player disks.

Value for money 9/10

GRAPHICS

FRACTAL LAB 2

EdLib

Nice but not really state of the art and a bit boffin orientated. I like *FracGen*, as it's a real original fractal curve program: rather than always getting sidetracked into Mandelbrots and Julia sets, it sticks to simple but effective iterations of two- or three-stage curves.

Value for money 5/10

CELLULAR AUTOMATA

EdLib

A nice collection of all sorts of variations on the *Life* program. I remember back in the dark ages before fractals were a thing to be reckoned with, myself and a chum had a program on the Apple II which played the game of *Life*, where cellular animals lived and died and migrated on your screen is a burst of colours. These single-celled animals would live and die depending on certain rules, and the aim was to keep the species going.

This idea has grown recently and there are now *Life* programs for all manner of computers. Although it's not as interesting as fractals, *Life* certainly has a bit of an addictive grab. And it's more of a spectator sport than you would imagine. Best programs on the disk are *Bugs*, *Life 3D* and *Demon*.

Value for money 6/10

GRAPHICS MASTER 2

EdLib

Another EdLib collection of golden greats, this time featuring graphics programs. The disk has a copy of *ROT*, a 3D modeller program that I'd forgotten about, as it was originally used with *VideoScape* when you wanted to create objects without having to use a piece of graph paper and a pencil. It was a nice enough 3D program for its time, but since the likes of *Real 3D*, *3D Construction Kit* and *AMOS 3D* came out, nobody wants any of this sort of thing any more. Still, you might find it useful – be sure and let me know what you use it for if you do.

The demo is a freeware clobbered version of the *3D Master* program, which is a sort of 3D ray-

continued on page 150

WHAT'S AVAILABLE?

Utilities

These are programs which help you use your computer. Some are just simple commands for your C directory for use from the CLI or Shell, while others are complete menu-driven programs to compress files, convert them from one format to another or even rescue broken disks. The best disks to look for are the collections with a selection of the best utils all squeezed on to one disk.

Applications

Some of the best programs are PD. *SID*, for example, is one of the best graphic interfaces for AmigaDOS, and it's PD (or, to be more precise, 'shareware'). *SID* is a graphic front end for the AmigaDOS file system, allowing you to move files around, delete them, rename them, copy them and re-organise your disks. In fact, I don't know a single Amigahead who would be without their copy of the program. And there are many other kinds of programs too, from business to graphics applications. Check the PD libraries before you lash out some cash on a commercial program – you may find a public domain solution which could save you pounds.

Demos

This is a new art form. The demos are created by a team of hackers, usually called a 'crew' or 'team', who get together and have a 'late night hack attack' and create a dazzling demonstration of their programming abilities. The demos can be graphics- or music-based, but they always have the feel of a pop video, and the music is generally of the dance variety, although some more exotic sonix do come out from time to time. Demo teams usually go on to be professional programmers after a while, so their demo days are usually limited. Scoopex and Silents are two of the best teams, and also the likes of Kefrens are not to be missed. Imagine a cross between a dance record, a video and a lightshow and you're getting the general idea.

Game demos

In recent years, the various major software houses have watched the PD arena growing and have noticed that lots of people buy demo disks. So they put out demos of their new releases, allowing the punters to try the game before they buy. Demos of this kind usually turn up on the covers of magazines like our sister publication *Amiga Format*, and then before long the demos turn up on their own in PD libraries. A successful and popular demo translates into a very popular game – for example, take note of the enormous success of *Lemmings*, from Psygnosis, which started life as just such a demo.

Slideshows

Some Amiga artists spend a lot of time creating works of art on their computers, which is no good if nobody sees them. So many Amiga artists make slideshows of their work for public consumption. If you're very clever (or own one of the fab new snapshot cartridges) you can grab the art and examine it to see how it was done, and you could even use it as clip art in your DTP packages. (Beware, though, some PD artists may get a bit cross if you do. Remember that unless explicitly stated, copyright remains with the artist, which means that you can't reproduce the work without their permission.) Some of the most stunning Amiga art comes from a chap called Tobias Richter, an artist who lives in Germany. He uses a ray-tracer called *Reflections* (coming soon to the UK), and turns out some amazing stills and animations based on *Star Trek* and other sci-fi subjects. Watch out for him under the name Agatron.

Music Demos

Some PD authors are music nuts, who spend their lives churning out disks of tunes for you to play on your Amiga. Some are *Soundtracker*- or *Noisetracker*-sampled tunes from the charts, re-mixed in the Amiga. Others are synthesized tunes from the classics. Most are pretty good. If you like well-sequenced music, I think you'll be surprised at the very high quality of the tunes around on the Amiga PD circuit.

Disk magazines

Magazines on disk are not new, but there are more now than ever before. *Newsflash*, *17 Bit Update*, *Computer Lynx*, *Scanner* and *Jumpdisk* are prime examples of the type of thing I'm talking about and they are, on the whole, very good. Magazines of this type usually contain PD software, demos and music, plus a lot of graphics and text as well. The text is normally reviews of software and hardware, and is usually quite short to keep the amount of different text files up and leave space for programs too. The text is sometimes a bit on the ropey side, but that's what you get for having a writer who's an editor too. A spelling checker wouldn't hurt some of these guys, I can tell you. Not, of course, unless you hit them with the disk!

PD categories

There are some varieties of public domain software which are not free to all. These are:

1 Licenseware

These are programs which are licensed to specific PD houses, to prevent the free distribution of the program – although the price to the consumer is more or less the same. *MED* is a good example; it's a music program which is licensed to Amiganuts United. This program is sold by Amiganuts, and a proportion of the fee goes back to the author in Finland. This scheme works better than shareware (see below) from the authors' point of view, as the money is handed over when the disk is purchased, rather than trusting the users to pay up later.

2 Shareware

This is a branch of PD that you pay for, but are allowed to use free for a short time first to see if you like it. It isn't expensive, as the author usually only asks for between £5 and £25 for his or her efforts. In most cases it's worth paying in the end, as you get free upgrades and documentation.

There are lots of 'ware'-type schemes. Freeware is usually the name given to normal PD. Beerware was one idea where the fee for using the program was to send the author some beer. Exclusiveware is a new idea, which works a lot like licenseware. Others, like Charityware – if you keep the program you are requested to donate a sum of money to a charity – are reasonably easy to work out from their descriptions.

continued from page 148

tracing program. It doesn't work too well on my machine, but that could be my fault for not giving it enough memory. It looks reasonably good, though, and has a few elements in common with Octree Software's *Caligari* editor.

The main event on the disk is the 'graphics programs' drawer, which contains a wonderful selection of image tools. *ImageLab* is a powerful image transformation tool, which allows you to reduce and edit the colours in an IFF file, and even translate it into a halftone. It takes a while to work, but the results are nothing less than stunning. *IFFMaster* is another approach which lets you alter the format of an IFF file to another format – high-res to low-res, for example, turning HAM off, that sort of thing. *Mostra* is a universal file viewer, although I prefer *Superview* myself. *Image Tools* is a collection of CLI programs for you to run which change the colouration of a file, give you a histogram of colour useage and various other tasks.

All in all, a very handy collection of tools, and a disk you should definitely look in to if you're serious about graphics.

Value for money 8/10

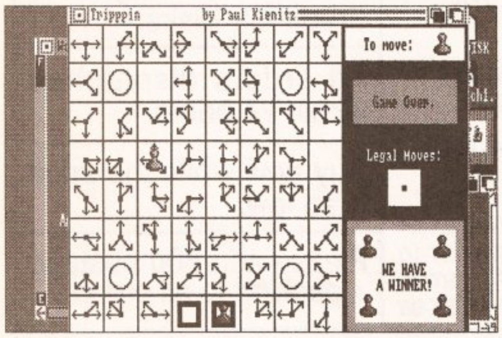
DEMOS & GAMES

ALIENS SLIDESHOW DEMO

17 Bit 1270

A very entertaining series of digitised images from the *Aliens* film, accompanied by an atmospheric tune. Nicely done, but of limited staying power.

Value for money...6/10



***Tripppin* – a very suspiciously-named 70s game...**

CLASSIC GAMES

EdLib

A collection of famous Amiga games, like *3D Tic-Tac-Toe*, *China Challenge*, *Backgammon* (which I still don't know the rules to!), *GoMoku*, *YachtC3*, *Monopoly* and *Chess*. Something to while away the wee small hours.

Value for money 8/10



Fans of Sigourney Weaver will like the *Aliens Slideshow Demo*, which can found on 17 Bit disk 1270.

WORKBENCH GAMES

EdLib

Some games to play while a disk is formatting, or you're downloading something and want to idle for a minute. Contains a few good games like *Yawn*! and *MiniBlast*, but my favourite is *Tripppin*, a game based on an old 70s board game.

Value for money 8/10

THUNDER JAWS DEMO

17 Bit 1287

A demo of the *Thunder Jaws* game. The demo has some pretty graphics and powerful sounds, but little to offer in the way of gameplay other than that. It's reasonable, but nothing earth-shattering.

Value for money 5/10

GOOD NIGHT

If you have any questions about PD, or some viewpoint you would like to share with me, then why not drop me line at Public Domain World, *Amiga Shopper*, 30 Monmouth Street, Bath BA1 2BW. Or e-mail me on CIX as snouty@compulink.cix.co.uk, Prestel/Micronet as 219997854, Telecom Gold as 74:mik2077 or The Direct Connection as uad1135@dircon.uucp. AS

UK PD HOUSES

Amiga Mouse PD
182A High Street
Margate
Kent
☎ 0843 228166

Amiganuts United
169 Dale Valley Road, Hollybrook,
Southampton SQ1 6QX
☎ 0703 785680

Akore Shareware
7 Fishergate Point, Lwr Parliament Street
Nottingham NG1 1GD
☎ 0800 252221

AMOS PD Library
25 Park Road, Wigan WN6 7AA
☎ 0942 495261

Anglia PDL
115 Ranelagh
Felixtowe, Suffolk IP11 7HU
☎ 0394 283494

Blitterchips
Cliffe House, Primrose Street
Keighley BD21 4NN
☎ 0535 667469

CanDo PD Library
128 Portland Crescent
Stanmore, Middlesex HA7 1NA
☎ 081-204-3954

CeN Computers
354 High Street
Chatham
Kent ME4 4NP
☎ 0634 831870

CLS
PO Box 7, Bletchley
Milton Keynes MK2 3YL
☎ 0908 640763

Comp-U-Save
PO Box 157, Hayes, Middlesex UB3 4SR

Crazy Joe's
145 Effingham Street, Rotherham
South Yorks S65 1BL
☎ 0709 829286

Digital Applications
118 Middle Crockerford
Basildon, Essex SS16 4JA
☎ 0268 553963

EdLib
Scotland Farm, Stockwood Road
Brislington, Bristol BS4 5LU
☎ 0272 723489

Electriclown
90 Notley Road, Lowestoft
Suffolk NR33 0OG
☎ 0502 566752

EMPDL
54 Watnall Road, Hucknall
Nottingham NG15 7LE
☎ 0602 630071

Goldstar Computers
PO Box 2, Tydlesley
Manchester M29 7BN
☎ 0942 895320

ICPUG
PO Box 1309, London N3 2UT
☎ 081-346 0050

Kernow Software PD Library
51 Ennors Road, Newquay, Cornwall

NBS
132 Gunville Road
Newport
Isle Of Wight PO30 5LH
☎ 0983 529594

New Wave Software
PO Box 199
Manchester M1 1JE
☎ 061-839 5378

PAS Amiga PD Club
3 St John's Walk
St Ives,
Cornwall TR26 2JJ

PCS International PD
Freepost WN5157F
Hindley, Wigan
Lancs WN2 3BR
☎ 0942 521577

PD Direct
Dept ASH, Unit 3
Railway Ent Centre
Shelton, Stoke ST4 7SH
☎ 0782 281506

PD Soft
1 Bryant Avenue
Southend-On-Sea
Essex SS1 2YD
☎ 0702 612259

Postal PD
77A Nottingham Road
Eastwood
Notts NG16 3AJ
☎ 0773 531991

Public Dominator
PO Box 801
Bishop's Stortford
Herts CM23 3TZ
☎ 0279 757692

Riverdene PDL
30a School Road
Tilehurst
Reading, Berkshire RG3 5AN
☎ 0734 452416

Sector 16
160 Hollow Way
Cowley, Oxford
☎ 0865 774472

Seventeen Bit Software
PO Box 97, Wakefield
West Yorks WF1 1XX
☎ 0924 366982

Softville
Unit 5, Stratfield Park
Elettra Avenue, Waterlooville
Hants PO7 7XN
☎ 0705 266509

Start Computer Systems
Barbican House, Bonnersfield
Sunderland SR6 0AA
☎ 091-564 1400

Vally PD
PO Box 15
Peterlee
Co. Durham SR8 1NZ
☎ 091-587 1195

Virus Free PD
23 Elborough Road
Moredon
Swindon
Wilts SN2 2LS
☎ 0793 512321

West Midlands PD
33 Springhill Rise
Wribbenhall
Bewdley, Works DY12 1EA
☎ 0229 402747/400490

Workbench PD
1 Buccluech Street
Barrow-In-Furness
Cumbria LA14 1SR
☎ 0229 870000

WE MUST BE MAD

Due to massive bulk buying and low cost advertising we can offer you THE BEST DISKS AVAILABLE AT THE MOST COMPETITIVE PRICES

3.5" DSDD DISKS FROM 31p INC VAT + LABELS Qty's of 100+

Qty's below 100 @33p each; 250+ @ 30p each; 500+ @ 29p each

ALL DISKS CERTIFIED 100% ERROR FREE

SONY 3.5" 38p DSDD BULK

3.5" DSHD.........65p
5.25" DSDD.......21p
5.25" DSHD.......36p

100 Capacity Disk Box.......4.25
50 Capacity Disk Box.........3.50
Mouse Pockets.................1.75
Mouse Mat........................2.25
Printer Stand....................4.25
Amiga/Atari Dust Cover.....2.95
Posso Box.........................15.95
3.5"/5.25" Cleaning Kit.....1.95

Amiga 512K RAM Expansion with clock........................24.95
Amiga/Atari External Drive (Zydec)..........................54.95

THIS MONTHS SPECIAL OFFER 200 3.5" DSDD DISKS + 2 x 100 CAP BOXES **66.95**

Please add £3.35 p&p/next day £8.50. Cheques/POs to PLC COMPUTER SUPPLIES (Dept ASH) 11 Meakin Avenue, Clayton, Newcastle, Staffs STA 4EY.

TELESALES HOTLINE **0782 212970**

Access VISA

SPARE A MINUTE?

JUST HAVE A LOOK AT THESE GOODIES!

HUMDINGER 41

Two superb disks packed to the brim with forty one quality PD and shareware games for your enjoyment.

CONTENTS INCLUDE

Chess, Peg Puzzle, China Challenge, Welltrix, Death Bringers, Tripppin, Super Gridder, Video Poker, Dilemma, Ping-Pong, Circuit War, Tron, Kamikaze Chess, Invaders!, Sorry I, Bally III, Backgammon, Cosmoroids II, Shoot-Out, Trek-Trivia, Deluxe Hamburger

PLUS TWENTY OTHER ENTERTAINING & ABSORBING GAMES

ALL FORTY ONE GAMES FOR ONLY £4.99 INCLUSIVE

WHY NOT EXPERIENCE SCANNER 3?

THE FASTEST GROWING 2 DISK AMIGA MAG

GAMES

DILEMMA (New & exclusive)
MOSAIC (Addictive Puzzler)
TETRIS (Knockout Version)
H-BALL (Compulsive Breakout)

DEMOS & ANIMATIONS

QUARTEX SUBSTANCE DEMO
THE TUNNEL DEMO
JUGGETTE II THE REVENGE

UTILITIES

SPECTRAPAINT V3.4 (The No.1 paint package).
MENUMASTER V2.1 (Very latest with full docs).
DOSHELP & GLOSSARY. (Two great handy aids).
POINTER ANIMATION (Create your very own moving masterpieces!)

Plus of course all the usual articles/news/reviews/competitions/letters/PD scene/Special offers etc. etc. IN OTHER WORDS A REALLY GREAT READ!

"Scanner is so good that my head almost exploded with excitement!" Jason Holborn, NEW COMPUTER EXPRESS.

"The last two issues provided the cream of the demos and games". Phil South, AMIGA SHOPPER. Value for money 9/10

OUT NOW FOR ONLY £2.50 + 50 P&P

SPECIAL OFFER, BUY SCANNER 3 & HUMDINGER 41 FOR ONLY £7.00 Inc.

MEGA CLIP ART PACK. We believe this is the ultimate clip art pack for your Desk Top Publishing program. Eight superb disks containing hundreds & hundreds of pics from a great variety of subjects too many to list. All taken from Amiga/PC/ST/Apple etc and all in IFF format so can be used in D/Paint and other paint programs.

WHY PAY £25-£30? ALL EIGHT DISKS ONLY £9.99 INC.

Please make Cheques/P.O.s payable to N. JORDAN and order now from
TELESCAN COMPUTER SERVICES (AS)
Handsworth Road, Blackpool FY1 2RF

digitz

P.O. Box 144, Mexborough, South Yorkshire, S64 9SL
Tel: (0709) 571748
9am - 7pm Mon-Sat

2000 Public Domain disks to choose from. We carry the complete Fred Fish, T-BAG, Topik, N.Z.A.U.G. & AMOS collections, plus Deja Vu Licenceware.

DISK PRICES

1-9............£1.25 each
10-19...........£1.10 each (+1 disk free)
20 or more....£1.00 each (+2 disks free)

Cat disk 50p. 10 Blank disks £4.99

Licenceware £3.50 each, £5.50 for a two disk set. ***All Licenceware is supplied with the official Deja Vu label, and a free single disk case.***

DEJA VU 1: COLOURING BOOK
DEJA VU 2: ARC ANGEL'S MATHS
DEJA VU 4: THINGAMIJIG
DEJA VU 5: JUNGLE BOOK (1 Meg)
DEJA VU 6: PUKADO
DEJA VU 8: WORK AND PLAY (1 Meg)
DEJA VU 9: AMOS ASSEMBLER
DEJA VU 10: THE WORD FACTORY (1 Meg)
DEJA VU 14: PLAY IT SAFE (1 Meg)
DEJA VU 17: DOGFIGHT 2 (1 Meg)
DEJA VU 22: LC10 FONTS
DEJA VU 24: THE SHINING WAY OF KUNG FU (2 disks) (1 Meg)
DEJA VU 30: SHYMER (1 Meg)
DEJA VU 33: AMOS CREATIVE ADVENTURE TOOLKIT (1 Meg)
DEJA VU 34: INVOICE PRINTER (1 Meg)
DEJA VU 35: T-TECDRAW (1 Meg)

Please make cheques/P.O's payable to Digitz
★ ALL MAJOR CREDIT CARDS ACCEPTED ★

No minimum order, same day despatch
We pay the postage (UK)

European orders please add 20p per disk.
Rest of world add 50p per disk.

UTILITIES

PCQ PASCAL....................a pascal compiler
A68K..............................68000 assembler
MED V3.11..............................music editor
D-COPY.......................................disk copier
RSI DEMOMAKER.....................brill demo maker
T.S.B. VECTOR DESIGNER........ace program
KWICKBACKUP.......................hard disk backup
M.V.K. V2.1......................................virus killer
ZEROVIRUS III V1.18 ....good killer
BOOTX V3.64 ....good virus killer
ST EMULATOR...it works
SPECTRUM EMULATOR...........oh! memories
STARTREKKER.........................4/8 track editor
NOISETRACKER ....loads of versions
TEXTPLUS 2.2E ....nice word processor
ARP V1.3................some useful commands
SID V1.6...........................the best directory util
AMIBASE V3.67 ....very good database
ELECTRO CAD...............design your circuits
M-CAD..................................amiga cad program
NOISEPLAYER V4 ....a great module player
UEDIT V2.3...................................word processor
FLEXI BASE V2.00...........................neat database
C MANUAL V2.00 ....all you need for C
MED V3.10...........new version music editor
ANALYTICALC............powerful spreadsheet
ICONMANIA...................................icons & tool
WINDOWS BENCH ....new look workbench
MESSYSID..................................handles PC files

MUSIC

BABY SITTIN BOOGIE ....funny sampled song
BARTMAN REMIX...........................great sounds
NEWTRONS MUSIC BOX ....very well done
KEFRENS JUKEBOX............select and listen
STAR DREK ....2 disk comedy
JOURNEY INTO SOUND..............and so it is
BARD IN A BOX.........first disk from academy
POWERMUSIC ....power lords music disk
FOOLS GOLD..........good music from sanity
BANGING RAVES...........music from intuition
STARLINE ....select and listen tracks
TALK TO THE TREES .....great sampled song
GOLF GAME ....brill 2 disk sample
VOGUE CD PLAYER ..looks and sounds good
VIVALDI ....2 disk classical
DEMONS MUSIC.............................quality sounds

ANIMATIONS

ROTAMIGA (1.5meg).....neat ray traced anim
MORE CLASSY ANIMS ....good quality
POGO (1.5meg) ....good anim with sound
RANDI BRAZEN (1meg)...........a bit x rated
UGLY MUG (1meg).........very good digi anim
THE MAGICIAN (1meg).........ray traced anim
STEVES ANIMS (1 TO 5).........very tidy work
FILLET THE FISH.....................very amusing
AT THE MOVIES (1.5meg)................brilliant
PUGGS IN SPACE ....cute little alien
ANTI LEMMIN (2meg) ....got to be the best
TIRRENO (1meg).........good ray traced anim
THE STORY OF A VIRUS (1meg) ....neat
CAR ANIM (1meg) ....great graphics
THE GYMNAST (1meg) ....ray traced & tidy

GAMES

NESTOR....................very good card game
MENTAL IMAGE GAMES (1meg) ......fantastic
ARCADIA.....................good Amos breakout
AMIGA RACE (1meg)..............get set and fire
MAHJONG ....nice gfx good game
THE HOLY GRAIL (1meg)..........good adventure
STAR TREK.................2 disk space voyage
TRUCKING ON (1meg)......great 2 disk game
SHAPES.........................addictive puzzle game
MEGABALL ....a great game of breakout
BALOONACY ....drop those bombs
LAZER-ZONE...........................arcade blast em!
ST-BASH..................................good old invaders
DESTINATION MOON ....tricky space game
CHINA CHALLENGE ....addictive puzzles
DUNGEON DELVER..2 disk arcade adventure
THE MAZE ....don't get too lost
HOLLYWOOD TRIVIA ....an interesting quiz
INSIDERS CLUB ....wheeling and dealing
WHEEL OF FORTUNE ....good quiz game
THE WOODEN BALL (1meg) .speedball clone
DRIP...arcade fun!
TOMTESPEL ....two player action
TILE TRAIL (1meg).............tidy puzzle game
EXCALIBUR............................shoot everything
PIXIE KINGDOM.............2 disk arcade quest
SEA LANCE ....strategy at sea
POM POM..........a very good blast em game
YELP..........................neat game for the kids
READY ROBOT DEMO (1meg).....fun learning

SLIDESHOWS

SUPERHAM CARS ....quality digi pics
WATERSHIP DOWN....catch the cute bunnies
GHOST HUNTING ....boo!
NETWORK ....superb art
NAGELESQUE ....brilliant artwork
MADONNA SLIDES ....3 disks of thingy
DEMONS III................great music & pics
AMIGA PARTY GRAPHICS ....very tidy work
LAUREL & HARDY (1meg)........cute 2 disker
DIGGY PICS ....2 disks/brill pics
NEMESIS PROLOGUE.............good artwork
NEMESIS CHAPTER 1 (1meg)...........2 disks
UTOPHIA CARTOON SLIDES................fun pics
HYPERDISK 1 ....good pics and story

DEMOS

DOLLY MIXTURE 1.......new look demo comp
DOLLY MIXTURE 2 ....more of the same
MELTED EXPERIENCE (1meg) ....brilliant
TOTAL DESTRUCTION...............crionics ok!
GLOBAL TRASH ....silents masterpiece
BASS MEGA ....very good from France
SILENTS ICE (1meg)............nice one silents
ENIGMA ....good phenomena demo
REBELS COMA (1meg) ....brill classic
PULLING THE TRIGGER (1meg) ....love this
BLUE HOUSE (1meg)..good demo and game
SCOOPEX CHROMIUM...........very well made
REBELS MEGA II.....................................neat gfx
SYSTEM VIOLATION..........great vector bobs
DO THE BARTMAN ....sounds good
BUDBRAIN II..............................poor madonna
FRACTAL FLIGHT II (1meg)............plays well
ACME MEGA (1meg)....................very fancy
WIZZCAT TRASHCAN.............................cooool!
TROPICAL SUNSET.............well done silents
NEVERWHERE ....neat demo from crionics
RED SECTORS MEGA ....brill classic
CRIONICS MEGA.................................very good
VISION MEGA (1meg)......................nice gfx
UP FRONT COOL FRIDGE (1meg) ...well done
VOI DEI MEGA (1meg) ....good multi part
DEXIONS MEGA.................................quite tidy
INTERSPACE ....good phenomena demo

BUYING ADVICE FOR SHOPPERS

Whether buying over the phone or at a local store, here's our advice on how to get what you want

BUYING IN PERSON

- Where possible, always test any software and hardware in the shop before taking it home, to make sure that it works properly.
- Make sure you have all the necessary leads, manuals or other accessories you need.
- Don't forget to keep your receipt.

BUYING BY PHONE

- Be as clear as possible when stating what you want to buy. Make sure you confirm all the technical details of what you are buying. Some things to bear in mind are version numbers, memory requirements, other required hardware or software and compatibility with your particular model of Amiga (that is, make sure you know which version of Kickstart you have).
- Check the price you are asked to pay, and make sure that it's the same as the price advertised.
- Check that what you are ordering is actually in stock.
- Check when and how the article will be delivered, and that any extra charges are as stated on the advert.
- Make a note of the date and time when you order the product.

BUYING BY POST

As with buying by phone, you should clearly state exactly what it is you are buying, at what price (refer to the magazine, page and issue number where it's advertised) and give any relevant information about your system set-up where necessary. You should also make sure you keep copies of all correspondence both to and from the company concerned.

MAKING RETURNS

Whichever method you buy by, you are entitled to return a product if it fails to meet any one of the following three criteria:

- The goods must be of 'merchantable quality'.
- The goods must be 'as described'.
- The goods must be fit for the purpose for which they were sold.

If they fail to satisfy any or all of the criteria, then you are then entitled to:

- Return them for a refund.
- Receive compensation for part of the value.
- Get a replacement or free repair.

When returning anything, ensure that you have proof of purchase and that you return the item as soon as possible after receiving it. For this reason it is important that you check the hardware or software as soon as it is delivered to make sure everything you ordered is there and works as it is supposed to.

HOW TO PAY

Paying by credit card is the most sensible way, whether buying in person, by post or on the phone, because you may be able to claim the money from the credit card company even if the firm you ordered from has gone bust or refuses to help sort out your problem.

Otherwise, you should pay by crossed cheque or postal order – never send coins or notes through the mail.

GETTING REPAIRS

Always check the conditions of the guarantee, and servicing and replacement policy, so that you know what level of support to expect. Always fill in and return warranty cards as soon as possible, and make sure that you are aware of all the conditions contained in the guarantee.

BUYING PD

Even though PD software is relatively inexpensive, you should still apply the guidelines set out above, making sure that you confirm all orders as clearly as possible.

Shopping around is still important when buying PD because different houses charge different prices for the same disks. There is no set pricing structure for disks, but bear in mind that PD houses are, in theory, supposed to be non-profit making operations. AS

A CHECK LIST FOR MAIL ORDER BUYING

1 Make sure you know exactly what you want. Draw up a checklist of the specifications you are looking for and what you want it to be able to do. Check with the suppliers that their product matches your list

2 Will the product you have in mind work with your existing set-up, and anything else you are planning to buy?

3 Can you see a demonstration? Many products are on display at computer shows around the country.

4 Are there any hidden extras? Does it need 1Mb to run, or a hard disk?

5 What technical support is provided by the supplier? Does the manufacturer offer after-sales advice? Check before you buy.

6 Check the guarantee terms. How long is the free warranty? What does it offer?

7 Draw up a list of these details and make them a condition of your order.

8 Check the price and delivery details when you order, and make a note of them.

9 Note down when you placed the order and who you spoke to.

10 When it arrives, check everything carefully. If anything is missing, don't use the product at all – contact the supplier. If it doesn't work, make the obvious checks such as the fuse. If it still doesn't work don't try to fix it – contact the supplier.

ADVERTISERS INDEX

WIN • WIN • WIN • WIN • WIN • WIN • WIN • WIN • WIN • WIN • WIN

Your chance to get into video



WORTH OVER £1,000!

The superb VideoCenter Plus (left) is our competition prize this month, and you can see from the rating we gave it in September (below) that it's well worth having.

Amiga Shopper's monthly video column will have whetted the appetites of many of you for exploring desktop video, but the expensive equipment required puts most off "having a dabble". Now Amiga Shopper, in conjunction with G2 Systems, is delighted to offer you the chance to explore this expanding area of the Amiga's influence. And we're not offering some budget starter system: no, our prize this month is a truly excellent piece of kit which any professional would be proud to own. With a list price of over a thousand pounds, the G2 Systems VideoCenter Plus is no toy. It's a genlock – a hardware device which overlays the Amiga's screen image on top of a video signal from a camera or tape recorder – but it's much more than just that.

As well as the usual genlock controls for fading the Amiga and video screens in and out, the VideoCenter Plus has a series of faders which control 'wipes' – effects where one screen is transformed into another or sections of one screen are shown in a 'window', like the picture in the corner of a news bulletin. Ten different wipes are provided, and you have full control over positioning and the speed of transformation. All this can either be controlled by switches on the hardware, or from the Amiga using the software and cable provided.

Amiga Shopper reviewed the VideoCenter plus in the September issue. Our resident expert Gary Whiteley was impressed. In awarding it the unusually generous score of 82/100, he said:

"I tested the VideoCenter Plus with a Panasonic F-10 camera and a domestic VHS player, and was impressed with the quality of the genlocking produced. The wipe edges are clean and sharp and all of the wipes looked good. The faders are smooth and positive, and the layout of the control panel is straightforward, making all the controls easy to get at and use. Even when using a domestic VHS player the quality was better than I would have expected. It would seem that the VideoCenter Plus can follow and encode even relatively poor quality signals well, which means that the build-quality of the circuitry is high – which, of course, you would expect from a company with the reputation of G2 Systems.

"And, unlike some systems I've seen, it is possible to reduce the size of the wipes right down to several pixels in size and still see that the edges are crisp."

The VideoCenter plus could open up unexplored avenues of Amiga usage for you. Fancy winning it? It couldn't be simpler. On the right are three questions about video; between pages 122 and 123 there is a tear off card. Enter your answers and name and address on the card, stick a stamp on it, and drop it into the postbox.

All the usual small print applies: no correspondence, editor's decision is final, employees and relatives don't bother etc. Closing date for entries is November 7.

QUESTIONS

QUESTION 1
What does VHS stand for?
a) *Very High Sharpness*
b) *Video Home System*
c) *Video High Scanning*

QUESTION 2
What does 'video' mean in latin?
a) *I remember*
b) *I record*
c) *I see*

QUESTION 3
What was the name of the failed video system launched by Sony in the Seventies?
a) *SonyVision*
b) *Studio/8*
c) *Betamax*

Write your entries on the card between pages 122 and 123, and get it to us before November 7.

CHECKOUT VIDEOCENTER PLUS

Documentation..........9/10
The supplied manuals cover everything you need to know, and all the necessary explanations and a troubleshooting guide are included.

Ease Of Use............17/20
After it's connected up, the VideoCenter Plus is very easy to use; you'll soon become familiar with the simple layout of the controls and their functions.

Software.................7/10
Straightforward and to the point, even though it's as easy to use the unit manually as by remote control from software.

Hardware...............17/20
A well-designed genlock which co-ordinates with the Amiga colour scheme (if that's important to you), is well finished and appears to be durable. If the electronics of the unit are as solid as its shell, then this box should take the knocks and last for years. A little on the large side, though, which may be its only disadvantage.

Quality................ ..17/20
I couldn't really find anything to complain about with this well-built, solidly constructed piece of equipment. It performs as well as some 'broadcast quality' genlocks which I have tested.

Price.................. ....15/20
At £995 + VAT the VideoCenter Plus is certainly not a cheap solution to genlock problems, but it does reflects the high quality of the equipment and the facilities which it contains.

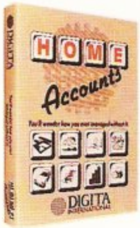
AMIGA SHOPPER 82/100

VideoCenter Plus does exactly what it sets out to do – that is, to genlock Amiga graphics with a video signal and produce effects for mixing and wiping between the two sources. As I always say, you gets what you pays for. And you *do* gets what you pays for with the VideoCenter Plus.

The Digita range...



Home Accounts2®
An advanced version of Home Accounts, which is limited only by the capacity of your computer. Sophisticated reporting with graphics, and special options such as VAT and loan calculation facilities. Equally suitable for businesses, clubs and charities (ST and Amiga). **£54.99**



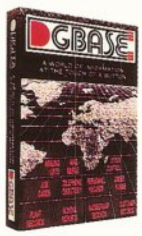
Home Accounts
Ideal for home users who want a simple low-cost way to plan and manage home finances. **£29.99**



DGCalc
This fast, simple spreadsheet includes many advanced features, including a windowing facility, so that you can look at different parts of the spreadsheet at the same time. **£39.99**



Mailshot Plus
If you ever need to send out mailings or print labels, this program is for you. Animated labels appear on-screen as a continuous sheet, allowing you to scroll backwards and forwards. You can search, sort and detect duplicate labels, print side by side and much more. **£49.99**



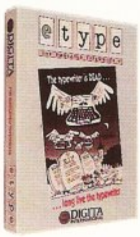
DGBase
If you're looking for fast access to information, and the ability to create customised reports, then this relational database is for you (ST). **£49.99**



Day-By-Day
An excellent way to get organised. You'll be reminded of birthdays, meetings and appointments. It includes month/week/day planners and automatic reminders of overdue events. **£29.99**



Personal Tax Planner
Plan your own tax with ease. This simple program will calculate your income tax liability, allowing you to perform instant 'what-if' calculations and produce pertinent facts about your tax position. A professional version is also available for accountants and financial advisers. **£49.99**

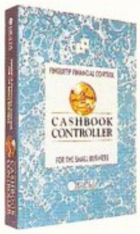


E-Type
Transform your computer into a typewriter. Because text is printed instantly, you can line up your form, press return and space a few times to move to the correct place, and then start typing. Ideal for filling in forms and envelopes. **£39.99**

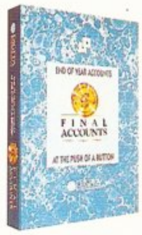


System 3
A suite of programs which perform all the basic functions for a small business. They may be used independently or integrated and include Cashflow Controller, Stock Control and Invoicing and Statements. **£59.99**

System 3e
Like System 3, but with extended capacity for customer accounts and stock items. **£79.99**

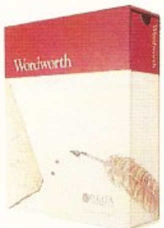


Cashbook Controller
Take the drudgery out of book keeping as this program will replace your cash and petty cash books. In addition to recording cash, bank and VAT transactions, you can enter credit sales and purchases, and for all these entries the program will automatically complete double entry routines, to ensure your records are always in balance. **£59.99**



Final Accounts
Using the information created with Cashbook Controller, this program will produce a complete set of accounts, including Trial Balance, Trading and Profit and Loss Account, Balance Sheet, as well as useful accounting ratios. **£39.99**

Cashbook Combo
A money-saving combination pack containing Cashbook Controller and Final Accounts. **£79.99**



Wordworth®
The graphical nature of Wordworth makes producing documents faster and easier. With the enhanced printing fonts, Collins Spelling Checker and Thesaurus, no other word processor comes close (Amiga). **£129.99**

The Digita range is available for Commodore Amiga, Atari ST and IBM PC unless stated otherwise, and every program comes with a seven day money-back guarantee.

The only way to really appreciate Digita software is to use it. Phone 0395 270273 for more information, or write to Digita, FREEPOST, Exmouth EX8 2YZ. All prices include VAT, postage and packaging.

DIGITA® INTERNATIONAL

software thats right™

The Digita range is available to the trade through Columbus, Gem, HB Marketing, IBD, Lazer, Leisuresoft, Precision and SDL.

Digita International Ltd Black Horse House Exmouth EX8 1JL ENGLAND Tel 0395 270273 Fax 0395 268893

– A member of the Digita group –

NEW PACK INCLUDES THE SIMPSONS!!!

CARTOON CLASSICS





AMIGA 1Mb. CARTOON CLASSICS PACK

This Great New Pack from Commodore offers everything for ALL THE FAMILY. A Great Computer with some Brilliant Games featuring the latest CARTOON HITS...

AMIGA A500* COMPUTER with
(Complete with Mouse, Leads, Manuals etc as listed * below)

A501 RAM UPGRADE, OFFICIAL COMMODORE 0.5Mb. Extra Memory Module

Plus... CARTOON CLASSICS

- THE SIMPSONS Bart V The Space Mutants
- CAPTAIN PLANET and The Planeteers
- LEMMINGS The Best Selling Game of 1991
- DELUXE PAINT III Art and Animation in one!

Only... **£372.99**

BUY A SORCERORS PACK TOO!

MORE AMIGAS

AMIGA 1Mb. SCREENGEMS PACK

Std Amiga A500* & A501 1Mb.RAM upgrade

Back to the Future II
Shadow of the Beast II
Days of Thunder
Nightbreed & Deluxe Paint II

Great Value... **£372.99**



AMIGA 0.5Mb. 'STAND ALONE' PACK £310
Standard Amiga A500* without any software package.

AMIGA 1Mb. STAND ALONE PACK (inc. A501) £349
Std Amiga A500* without software but with CBM A501 0.5Mb. u/g to 1Mb.

First Steps
Endorsed by the National Association of Primary Education
FREE...Video approved by National Council of Education Technology

AMIGA CLASS OF THE 90's PACK

Std Amiga A500* & CBM A501 1Mb.RAM u/g

Plus...

Pro-Write (WP)	Let's Spell at Home
Deluxe Paint II	Talking Turtles
Deluxe Print II	BBC Emulator
Infofile (D/Base)	10 CBM Disks
Music Mouse	Mouse Mat
Amiga Logo	Resource File

Only... **£469.99**

AMIGA 1500 COMPUTER PACK

The supreme Amiga pack for Business, Home, Education and Leisure includes:

Central Processing Unit (CPU)...
!mb. RAM, two 3.5" Floppy Disk Drives and eight Expansion Slots that will take all Amiga 2000 Peripherals. The HEART of your system.

Keyboard and Mouse...
Plug-in Keyboard with a Numeric Key Pad, 4 Cursor Keys. Two Button Amiga Mouse.

Plus some Superb Software!

- THE WORKS: Fully integrated Word Processor, Spreadsheet, & Database
- DELUXE PAINT III - 'The New One!'
- THEIR FINEST HOUR - The Battle of Britain, POPULOUS - The Promised Lands, SIM CITY - Terrain Editor, and BATTLE CHESS - 3D Animated!

AMIGA 1500 CPU/KEYBOARD (As detailed)	£649.99
AMIGA 1500 (As detailed) + 1084S Monitor	£899.99
AMIGA 1500 (As detailed) + CM8833/II	£885.99

STANDARD AMIGA A500

All our Amiga Packs are Genuine UK Spec. with the following standard items/features:

Amiga A500 Computer-512K RAM, Workbench System & Extras Disks, Full set of Amiga Manuals, 4096 Colours, Built-In Speech Synthesis, All Connecting Leads, 1Mb. Internal Disk Drive, Built-in TV Modulator, Kickstart 1.3, Amiga Mouse, Multi-Tasking, Notepad Easy to use basic Word Processor, Stereo Sound,

Remember this is the minimum configuration. Most of our packs contain EVEN MORE!!!

AMIGA CARTOON CLASSICS + CM8833 Mk II MONITOR
Including the necessary leads and dust covers for both Amiga and Monitor £615

AMIGA CARTOON CLASSICS + CM8833 Mk II MONITOR + STAR LC 200 COLOUR PRINTER
Including the necessary leads and dust covers for Amiga, Monitor & Printer £815

OTHER AMIGA PACKS ALSO AVAILABLE - Phone us for details.

BUY A SORCERORS PACK WITH ANY OF MERLINS AMIGAS AND SAVE EVEN MORE WITH SOME GREAT PRICES!!!

SORCERORS PACK 1
Quality Mouse Mat
Quality Thick Vinyl Amiga Dust Cover
Microswitched Joystick and
Ten Blank Disks in Library Case
The ideal starter pack!
£18

SORCERORS PACK 2
DATASTORM, DUNGEON QUEST, E-MOTION, GRAND MONSTER SLAM, SHUFFLEPUCK CAFE, KID GLOVES, POWERPLAY, RVF HONDA, MICROPROSE SOCCER, TOWER OF BABEL
10 Great games with a retail value of £224.50
£25
Only £36 INCLUDING SORCERORS PACK 1

SORCERORS PACK 3
Sorcerors Packs 1 & 2 Together PLUS...your choice of one Title from Merlins Software Selection
Great all-in-one pack!!!
£45 Based on £24.99 rrp (See Listings), add difference if reqd.
Software not listed can be obtained too...PHONE US!

Only when purchased with an Amiga

AMIGA MONITORS



PHILIPS CM 8833/II
14" Stereo Medium Resolution Colour Monitor with Green Screen Switch AND FREE LEAD
12mths. on site maintenance

Great Value... **£244.99**

COMMODORE 1084S
14" Stereo Med. Res. £259.99

Univ. Monitor Stand	£12.95
Monitor Dust Cover	£5.95
AV7300 TV Tuner	£79.95
Tilt/Swivel Stand	£14.95

(Only fits Philips CM8833 MkII!!!)

AMIGA PRINTERS

star REGISTERED DEALER



LASERPRINTER 4 ✪ £999
Fully HP-IIP & Epson compatible, 300dpi, 1Mb. memory (expandable to 5Mb.), serial/parallel, 14 fonts, RISC processor, full 1yrs on site maintenance.

STAR PRINTER RANGE

LC 10 MONO ✪ £159
9 Pin Dot Matrix, 240 x 240dpi, 120/25cps

LC 24/10 MONO ✪ £205
24 Pin Dot Matrix, 360 x 360dpi, 180/60cps

LC 200 COLOUR ✪ SPECIAL OFFER... £199
With a FREE Dust Cover OR Printer Stand!!!
9 Pin Dot Matrix, 240 x 240dpi, 185/40cps

LC 24/200 MONO ✪ £249
24 Pin Dot Matrix, 360 x 360dpi, 1220/55cps

LC 24/200 COLOUR ✪ £CALL
9 Pin Dot Matrix, 240 x 240dpi, 120/25cps

XB 24/10 COLOUR ✪ NEW LOWER PRICE £379
24 Pin Dot Matrix, 360 x 360dpi, 240/80cps, This is a true business machine capable of printing true letter quality at 48pin, huge 27K buffer exp. to 187K, with 12mth on site maint.

LASERPRINTER 4 STARSCRIPT ✪ £1199
Specification as Laserprinter 4, with an addition of Stars Postscript, 2Mb. Memory, 14+35 fonts , Apple Talk interface . 1yrs on site maintenance.

LASERPRINTER 8's avilable to order £Phone for full details.

CITIZEN PRINTER RANGE

120D+ MONO ✪ £139
9 Pin Dot Matrix, 240 x 240 dpi, 120/25cps

124D MONO £205
24 Pin Dot Matrix, 360 x 360 dpi, cps
NOW WITH FREE SEMI-AUTOMATIC SHEET FEEDER WORTH £47! WHILST STOCKS LAST

SWIFT 9 MONO £199
9 Pin Dot Matrix, 240 x 240 dpi, 160/40cps

SWIFT 9 COLOUR NEW LOWER PRICE £219
9 Pin Dot Matrix, 240 x 240 dpi, 120/25cps

SWIFT 24 MONO £289
24 Pin Dot Matrix, 240 x 240 dpi, 120/25cps

SWIFT 24 COLOUR NEW LOWER PRICE £309
24 Pin Dot Matrix, 240 x 240 dpi, 120/25cps

Merlin Express are Citizen Authorised Dealers...
CITIZEN Authorised Dealer — 2 YEAR — Citizen Printers carry a two year warranty.

FREE PRINTER STARTUP PACK
With all Citizens except the 120D+ you get 200Shts Cont A4 Paper, 5 Cont Envelopes, 100 Cont Address Labels, 1 Printer Driver Disk, 1 Cable for Amiga...FREE!!!

FREE WITH EVERY PRINTER (Marked ✪ thus) from MERLIN EXPRESS
LEAD FROM YOUR PRINTER TO YOUR AMIGA!!!

MERLIN WORD PROCESSOR AND PRINTER SUNDRIES PACKAGE!!!

Available with any Amiga or Printer purchased from Merlin

- ☆ PEN PAL...Brilliant Word Proc. with Database/Graphics
- ☆ 500SHEETS OF 11x9.5 PLAIN 60 GSM MICRO PERFED FAN FOLD CONTINUOUS PAPER
- ☆ 1-TOP QUALITY THICK PRINTER DUST COVER
- ☆ 1-UNIVERSAL 2 PART PRINTER STAND
- ☆ 1-SPARE MONO RIBBON

£99.99 or just £24.99 without Pen Pal W/P Software

AMIGA PERIPHERALS

COMMODORE A590 HARD DISK DRIVE
...... 20Mb. Std Unpopulated £279
...... 20Mb. Populated to 1Mb. £329
...... 20Mb. Populated to 2Mb. £369
OFFICIALLY UPGRADED BY COMMODORE NOT A CHEAPER THIRD PARTY U/GRADE!

COMMODORE 1011 3.5" 2nd DRIVE £79.95
For all Amigas: 500/1000/1500/2000, 880K Formatted Capacity, No external power supply required.

CUMANA 3.5" CAX 354 DRIVE £64.95
Enable/Disable switch, Throughport,

MERLIN 3.5" DISK DRIVE £59.95
3.5" Second Disk Drive, Enable/Disable Switch, Slim Design, 880K Formatted Capacity, No external power supply is needed, Throughport. THIS IS ONE OF OUR BEST SELLERS & GREAT VALUE!

COMMODORE 1352 MOUSE £39.95
Commodores Own!!!

NAKSHA MOUSE £29.95
Amiga/ST switchable, high resolution 280dpi, no additional mouse drivers required, includes mouse holder and mouse mat. E. A. Discount voucher!!!

COMMODORE A501 0.5Mb. £49.95
OFFICIAL AMIGA RAM UPGRADE

MIDI-MASTER INTERFACE £29.95
1 Through Port, 1 In & 3 Out

RENDALE 8802 GENLOCK £189.95
Semi professional Genlock device. Now you can mix both video and computer sources. Ideal titling to high standards.

NAKSHA A500 HAND HELD SCANNER
Coming soon! Look out for this one!!!

AMIGA SOFTWARE

GODS The Bitmap Bros. at their best! Greek Gods battle against monsters!!!	(£25.53rrp)	£19.99
TOKI Great Platform Arcade Game. 300 screens in fantastic cartoon style!	(£24.99rrp)	£19.99
EYE OF THE BEHOLDER Dungeon Master style game. Great graphics!	(£30.99rrp)	£20.99
PGA GOLF TOUR One of the most realistic golf simulations around!	(£25.99rrp)	£19.99
TEENAGE MUTANT HERO TURTLES A favourite with every youngster!	(£25.53rrp)	£16.99
DUCK TALES Become 'The Richest Duck in the World' in a global race!	(£25.53rrp)	£20.99
ROBOCOP II Based on the film of the same name with the same action!!!	(£25.53rrp)	£23.99
F19 STEALTH FIGHTER Forget the rest...THIS IS THE SIMULATOR!!!	(£29.99rrp)	£23.99
HOLLYWOOD COLLECTION 4 GAMES IN ONE! Batman, Robocop I, Ghostbusters II, Indiana Jones.	(£29.99rrp)	£23.99

SERIOUS SOFTWARE

FUN SCHOOL 3 Choose under 5's, 5-7's or 7 & over. Educational Fun!	(£24.99rrp)	£19.99
SUPERBASE PERSONAL 2 Keep records with this easy to use & powerful Database		£29.99
DISNEY ANIMATION STUDIO Outstanding animation for your Amiga.	(£99.99rrp)	£81.99
PHOTON PAINT II Paint prog. IFF/ANIM formats, 4096 colours, etc.	(£89.95rrp)	£29.99
PEN PAL Word processor with database built-in and graphics handling.	(£99.95rrp)	£79.95

MERLIN

EXPRESS LIMITED

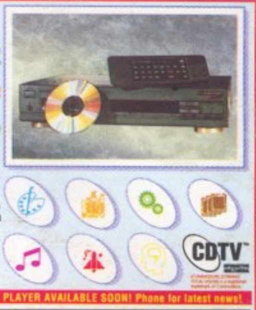
GREAT VALUE, THAT'S THE MAGIC OF MERLIN

STOP PRESS!!!

Commodore CDTV INTERACTIVE MULTIMEDIA

A NEW MEDIA REVOLUTION...

You get... THE NEW CDTV PLAYER with full infra red remote control plus leads to TV and audio system and an introductory "welcome disc" plus a voucher for Lemmings & Hutchinsons Encyclopaedia



£Phone
FOR DETAILS AND LATEST PRICES OF CDTV!

AMIGA ADD ON CD ROM PLAYER AVAILABLE SOON! Phone for latest news!

CHECK OUT OUR GREAT NEW CHRISTMAS PACKS. THEY'RE *SO* NEW WE HADN'T TIME TO INCLUDE FULL DETAILS ON THIS ADVERT!!!

New Sorcerors Packs with even MORE software, New Lower Pricing, New A690 CD Amiga Drive (available soon), New STAR LC20, XB24/200 & XB24/250 Printers, Nintendo and Sega Games Machines and lots of Special Offers to come!!!

PHONE US FIRST AND FIND OUT A LOT MORE ABOUT OUR NEW OFFERS!

PHONE FOR FULL LISTING OF CDTV TITLES, Both CD's AND 3.5" Disks!

ALL Merlin Prices Include VAT @ 17.5%

ORDERING

Just telephone our 24 Hour Order Hotline using your Access/Visa Card, or, send a cheque/postal order with your requirement details (cheques need clearance unless issued by a Bank/Building Society on your behalf).

DELIVERY

Small items are despatched by post FREE to all UK Mainland addresses. Hardware is despatched by courier service (up to 25Kg) as follows: NEXT WORKING DAY...add £7.50 to order, TWO WORKING DAYS...add £6, for SPECIAL SATURDAY DELIVERY...add just £12 *(Goods are normally despatched same day as order, unless otherwise discussed at the time).*

WARRANTY

Hardware proving faulty within 30 days will be exchanged for NEW. After 30 days and within 12 months from purchase, faults will be rectified by the relevant manufacturers' repair agent and returned to you by courier. Software and small items carry various warranties, please ask for details.

COLLECTION

Merlin Express Limited are predominantly a mail order company, but we welcome customers to our trade/collection counter who wish to pick up goods from us. Why not pay us a visit, we are always pleased to help you with your enquiries.

BFPO & EXPORT

Merlin are happy to supply BFPO and export markets for which VAT is normally deductable. Delivery charges vary from UK rates and, as products carry UK warranties only, faulty items are to be returned to Merlin by the customer and re-delivery charges will apply.

PLEASE NOTE...

Whilst every effort is made to ensure information in this advert is correct, you should always confirm any offers, prices, availability etc. prior to placing your order. We endeavour to supply goods as shown and will ONLY change details should it be made necessary by our suppliers etc. As our advertising is booked so far in advance Merlin therefore reserve the right to alter product specifications, withdraw any product/offer/service or update prices (and that can be up OR down), without prior notice. Merlin guarantee never to supply anything that has been subject to change without you, the customer, being informed of and agreeing to that change. Please ALWAYS confirm details PRIOR to placing your order.

E&OE

MERLIN EXPRESS LIMITED — MERLIN — Great Deals! The Magic of Merlin

MERLIN EXPRESS LIMITED
UNIT C7, THE ROPEWALK INDUSTRIAL CENTRE, STATION ROAD, ILKESTON, DERBYSHIRE, DE7 5HX.
Telephone: 0602 441442 FAX: 0602 440141

24 HOUR ORDER LINE TELEPHONE: 0602 441442

Access VISA